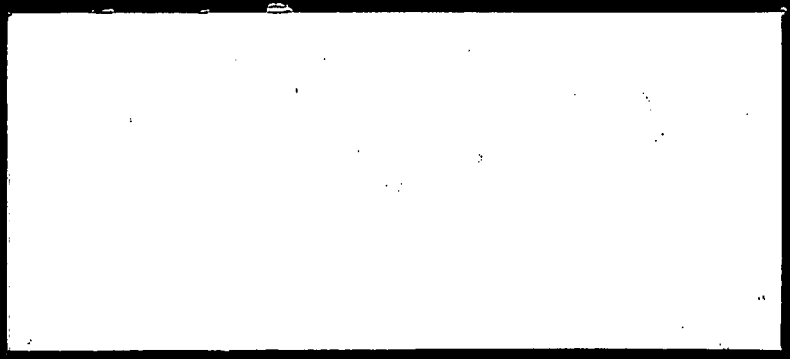
Harding Lawson Associates

Engineering and Environmental Services



A Workplan Prepared for
Texaco, Inc.
10 Universal City Plaza
Universal City, California 91608-7812

~~DRUM REMOVAL PLAN~~
WALKER PROPERTY SITE
BLOOMFIELD AVENUE AND LAKELAND ROAD
SANTA FE SPRINGS, CALIFORNIA

Paid 5/10/93

Client No. 2251
HLA Project No. 22263-1

by

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Civil Engineer - 22026

REGISTERED PROFESSIONAL ENGINEER
DONALD WALKER
EXP 3-31-93
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STATE OF CALIFORNIA

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March 15, 1993

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1.0 INTRODUCTION

This Drum Removal Plan (Plan) has been prepared for Texaco Environmental Services (Texaco) by Harding Lawson Associates (HLA). This Plan has been prepared in response to the First Amended Imminent or Substantial Endangerment Order and Remedial Action Order (Order) (Docket No. I&/SE 91/92-009) issued by the California Department of Toxic Substances Control (DTSC) and dated October 26, 1992.

1.1 OBJECTIVE

The Order states that drum removal from the Site shall be completed within 180 days of the effective date of the Order (October 26, 1992). This Plan presents HLA's approach to the tasks required to characterize the drum contents and to confirm disposal alternatives that have been tentatively selected based on the available Site data. The option of safe onsite storage of investigation-derived wastes, until the full site remediation is undertaken, has also been considered.

1.2 SITE DESCRIPTION

The Walker Property Site (Site) is a 21.32-acre parcel located at the southeastern corner of the intersection of Bloomfield Avenue and Lakeland Road in the City of Santa Fe Springs, California (Plate 1). The assessor's parcel number is 8026-001-042.

The Site is now nearly vacant. Although previous site facilities operated on many different areas of the property, little remains of these facilities (Plate 2). Balboa/Pacific Corporation (Balboa), which designs and constructs industrial wastewater treatment systems, is the only current (since 1986) tenant of the site.

Three aboveground storage tanks (AGSTs) remaining from Lakewood Oil Services' (Lakewood) waste-oil storage and filtration operations, are located in the northwest corner of the property. Some miscellaneous piping and an earthen-berm/concrete-wall retention dike remain in the southwest corner of the Site, where Powerine Oil Company (Powerine)

stored crude oil and jet fuel in two former aboveground storage tanks. The Balboa operations include a building and a materials storage/fabrication yard. An abandoned railroad spur lies along the eastern portion of the property. Although the spur is still in place, it does not connect to the main line tracks east of the Site.

The Order divided the Site into two portions (Plate 2), the Lakewood Section and the Railroad Section. The Lakewood Section is the area impacted by polychlorinated biphenyls (PCBs), metals, and hydrocarbons from Lakewood's operations; there is also a small number of drums placed on this area. The Railroad Section brackets the area around the railroad spur and is primarily impacted by aboveground asbestos-containing insulation in a limited area. According to the Order, the Powerine lease area is under the jurisdiction of the Regional Water Quality Control Board (RWQCB).

More than 200, 55-gallon drums are located near the southeast corner of the Site within the Railroad section, as shown on Plate 2. These drums remain from previous Site investigations and are reported to contain drill cuttings, well development/purge water, and disposable clothing/supplies for onsite workers.

1.3 SITE HISTORY

The Site is currently owned by Mr. and Mrs. George Walker (Walker). The Site was previously owned by Getty Oil Company (Getty) from 1934 to 1979. The property was used from 1928 to 1983 for several oil-related activities, including storage of crude oil, refined product, waste-oil, and storage/disposal of oil-well drilling fluids. The following historical information has been summarized from the Order and the Preliminary Endangerment Assessment (PEA) report (TRC Environmental Consultants [TRC], 1990) prepared for Walker. The accuracy of the following information has not been independently verified.

The Site is known to have been the location of AGSTs, USTs, and sumps (see Plate 2). In the late 1920s, three large AGSTs and four earthen sumps were constructed at the Site. During the 1940s, two large AGSTs and an earthen berm were constructed in the southwest corner of the Site, and 23 small AGSTs were added in the northwest corner. Also during

the 1940s, three of the four earthen sumps were apparently removed, the remaining sump was enlarged, and a new sump was added. Eight of the twenty-three small AGSTs and three of the five large AGSTs were removed by 1962. A drainage area that ran from the northeast to the southeast corner of the Site and terminated in a pond area was filled in by 1962. Prior to 1974, the sole remaining sump had been filled in, and six new AGSTs were placed in the northwest corner. Prior to 1981, two more AGSTs were placed in the northwest corner, and one AGST was placed in the west central portion of the Site.

In 1964, Getty reportedly began leasing portions of the Site to tenants. A company identified as Mohawk Sales Inc. (Mohawk) reportedly leased the southern portion of the northwest section of the Site (11120 Bloomfield Avenue). Mohawk was issued a permit to install a 6,000-gallon UST and pump and (based on the reported activities of Mohawk) this UST is presumed to have been used for the storage of diesel fuel.

The northwestmost portion of the Site (11020 Bloomfield Avenue) was reportedly leased by Getty to Lakewood in 1965. Lakewood was apparently formed in the 1950s as a service organization to pick up and store used crank case motor oils until they could be recycled for further use. Lakewood also used their vacuum trucks to pick up materials from washdown sumps and to pick up used contaminated oils from various industries. Lakewood operated a waste-oil transfer facility at the site. Waste oil was brought in by vacuum trucks and discharged into a 12,000-gallon UST. The waste oil was pumped from the UST into several AGSTs, through various filters, and eventually into trucks to be sold. Lakewood reportedly filed for bankruptcy and vacated the Site in 1983. Actual descriptions and volumes of material handled are not available. Records indicate that Lakewood was issued EPA Identification Number CAT 080025729. It has been reported that approximately 120,000 gallons of waste oil was disposed of by Lakewood at BKK Corporation in West Covina, California, during 1981 and 1982.

Getty leased the two large AGSTs on the southwest portion of the Site to Powerine, which reportedly used these tanks for storage of excess crude oil and jet fuel. The Powerine refinery is located northwest of the Site on the northwest corner of Lake Road and

Bloomfield Avenue. Pipelines running along Bloomfield Avenue connected these tanks to the refinery. Powerine leased these tanks until it filed for bankruptcy in 1984.

In 1974, Getty leased a portion of the Site along Bloomfield Avenue to Norwalk Disposal Service, a company owned and operated by Walker. The property was used for maintenance and washing of the company's trash trucks. When Walker purchased the entire parcel from Getty in 1979, Norwalk Disposal Service continued to occupy that portion of the property. Following the purchase of the property, Walker also continued to lease portions of the Site to Lakewood and Powerine.

Walker leased the central portion of the Site (12600 Lakeland Road) to Gross Construction in 1981 to store heavy construction equipment, tractor trailer trucks, an aboveground 12,000-gallon diesel fuel tank surrounded by a containment wall, and several work trailers. Gross Construction occupied the Site until 1989.

Walker also leased an additional portion of the southern section of the Site to Powerine in 1982. Powerine is reported to have subsequently entered into a sublease agreement with a company identified as Airco Industrial Gases (Airco) to build a carbon dioxide recovery facility in this area. The Airco facility was reportedly open for only a few months due to Powerine's bankruptcy in early 1984.

In 1986, Walker leased out a portion of the Site (11240 Bloomfield Avenue), just north of the large AGSTs in the southwestern corner of the Site. This portion was leased to Balboa, the only current tenant.

A PEA report (TRC, 1990) was prepared for Walker and its agent, Turner Development Corporation (Turner), in 1990. The purpose of the PEA was to initiate a DTSC overview of remedial planning for environmental cleanup of the Site. The PEA report summarizes past and current activities at the Site, particularly with respect to the management of hazardous wastes on the property. The results of 17 previous site investigations, prepared by four different consultants during the period from 1985 through 1990, are discussed in the PEA report. The previous site investigations were performed to assess the possible presence,

nature, and extent of hazardous substances on the Site. The PEA report indicated that subsurface conditions at the Site had been investigated by the following means:

- Ninety soil borings (119-foot maximum depth),
- Five groundwater monitoring wells (130-foot maximum depth),
- Forty-six exploration trenches (probably less than 10 feet deep),
- Forty-one soil-gas probes (typically 3 feet deep),
- Sixteen soil-gas monitoring wells (15 to 25 feet deep),
- Eighteen soil samples from tank and pipeline excavations, and
- Three asbestos samples from surface facilities.

Laboratory data from these investigations are summarized in Table 1, which lists all chemicals detected at the Site and their maximum concentrations observed. TRC determined that site soils were primarily impacted by hydrocarbon products, including waste oils, jet fuel, diesel fuel, and a limited amount of gasoline. Additional significant compounds found at the Site include polychlorinated biphenyls (PCBs), lead, barium, copper, and asbestos. Site soils were primarily impacted by hydrocarbon products, including waste oils, jet fuel, diesel fuel, and a limited amount of gasoline. Groundwater was found to contain petroleum hydrocarbons and some organic solvents.

1.4 STATUS OF DRUMS

On November 24, 1992, HLA personnel visited the Site to inventory the drums located in the drum storage area (Plate 2). Two hundred and nine, 55-gallon drums were counted in this area. At least 75 of these drums were empty. Fifty drums had been overpacked by the DTSC. Photoionization detector (PID) readings did not indicate that volatile organics were emanating from the drums. Several drums contained a black, tarry substance; this substance was also found in two 5-gallon buckets, two 25-gallon drums (one labeled methanation catalyst), and in several 55-gallon drums on the Lakewood portion of the Site.

Labels identifying the exact contents of the drums were not evident. None of the drums with secured tops were opened, so the exact contents of most of the drums remain unknown.

However, the general nature of the drum contents can be inferred from the previous analytical data for soil and groundwater samples, as presented in previous site investigation reports and summarized in Table 1, and because some drums have labels indicating a date, consultant name, or Walker Site that suggest the drums contain waste derived from site investigations.

2.0 SCOPE OF WORK

2.1 WASTE SAMPLING AND ANALYSIS

Because current drum labeling is inadequate to link specific drum contents to individual analytical reports, the contents of drums containing wastes will be determined by additional sampling and analysis. However, existing drum labels will be examined with an ultraviolet light to assess whether any faded information recorded on the labels can be retrieved. If useful data can be retrieved, they will be used to aid in waste profiling. Prior to sampling, all drums (including those in the Lakewood Section) will be gathered at the present drum storage area in the Railroad Section in the southeastern portion of the Site.

2.1.1 Procedures

All drums will be opened by appropriately trained personnel following proper safety precautions, as stated in the Health and Safety Plan presented in Appendix A. The contents of the drums will be inspected and tested in the field for primary hazard characteristics. Field tests will make use of commercial screening tests (HazCat® System of Haztech Infosystems, Inc.) in a decision-tree format to identify compatible wastes. HazCat® procedures are presented in Appendix B. The drums will be segregated by the physical and chemical characteristics of their contents. Similar soils will be consolidated into bins; drums containing similar liquids will be transferred to vacuum trucks.

The field team will inventory the drums in order to identify and document the location and characteristics of each of the drums on the site. This inventory will consist of plotting drum locations on a base map, numbering the drums, visual inspection, and logging drum characteristics. The drums will be clearly numbered using paint sticks and paint pens. Drum locations will be mapped with reference to physical characteristics and features at the site. A drum characterization log will be completed for each drum as it is visually inspected.

Drums not already located within the present drum storage area (a few drums are known to be scattered around the northern part of the Lakewood Section of the site) will be collected

and moved to the drum storage area. All personnel will be instructed on the hazards of drum handling before moving the drums and will be warned to be alert for new information about potential hazards. The drums will be moved to the storage area by using either a drum grappler attached to a backhoe or a front-end loader equipped with a bucket sling. Adequate volumes of absorbent will be kept close at hand during moving, and overpacks will be kept ready in case they are needed.

Drums will be opened by personnel in Level B protection. Before opening, all drum ring tops and/or bungs will be wiped clean and made free of debris. The area around the opening will be covered with sorbent material to prevent spills. If a drum cannot be opened by conventional means, nonsparking puncturing tools may be used. Bulging drums, if encountered, will be vented through the vent bungs before being opened. Field personnel will not attempt to puncture a bulging drum that cannot be vented by conventional means. Open drums may be placed in overpack containers prior to movement, if necessary.

If, during drum opening, some of the drums are found to contain materials that warrant the continued use of Level B protection, those drums will be closed, and additional procedures will be submitted to DTSC prior to any transfer activities for those drums.

As required by the Health and Safety Plan, an organic vapor analyzer (OVA) will be used to monitor breathing-zone air quality for organic vapors during the field activities (drum opening, waste characterization, screening, and bulking). If OVA readings are sufficiently low, personnel protection levels will be downgraded to Levels C or D. A HazCat® kit will be used to characterize the waste (solid or liquid) within the drums (Appendix B). Field measurement equipment will be calibrated at the opening and close of each field day according to the manufacturer's recommended procedures. Equipment manuals will be kept with each instrument. Calibrations will be recorded on the appropriate calibration form. Equipment maintenance will be conducted, if required, following the manufacturer's recommended procedures. Any maintenance performed on an instrument will be recorded on the instrument's calibration log.

Once waste characterization field screening is complete, the drums will be segregated according to compatibility. After segregation, compatible drums containing solids will be consolidated into 10 to 12 cubic yard (yd^2) bins, while liquid waste will be transferred to vacuum trucks.

Drums containing solid wastes will be emptied into the bins by either using a drum grappler attachment mounted on a backhoe, or a front-end loader with a bucket sling. Liquid wastes will be removed from the drum using the vacuum hoses connected to the vacuum truck. Bins containing solid waste will be numbered and a log kept of the type of waste within the bin and the number and location of subsamples collected from the bin.

Composite, representative soil samples will be collected from each bin as it is being filled, collecting at least one subsample for every 2.5 yd^3 of soil. A composite sample for laboratory analysis will consist of five subsamples. Soil samples will be collected using steel trowels. The soil subsamples will be placed in 6-ounce glass jars. The top of the jar will be covered with Teflon film and capped with a screw-down lid. Actual compositing of soil samples prior to analysis will be performed by the analytical laboratory. Liquid samples will be collected using a bottom-loading bailer with transfer to the appropriate containers (1-liter glass bottles or 40-milliliter volatile organic analysis [VOA] vials).

If materials in some of the drums are found to contain materials other than investigation-derived wastes, one subsample per yd^3 and one composite sample per five subsamples will be collected and analyzed.

Each soil and liquid sample will be individually labeled to prevent misidentification. Each label will note the sample identification number, project number, and time and place of collection. Sample collection equipment will be decontaminated between samples with a Liqui-Nox solution and rinsed with distilled water. Decontamination water will be stored in 55-gallon drums or small poly tanks.

Sample jars, bottles, and vials will be placed into Ziploc bags and stored on ice in an insulated cooler at approximately 4°C during transport to a State-certified laboratory. Chain-

of-custody protocol will be adhered to throughout sample collection, transport, analysis, and ultimate disposal. One field duplicate sample will be collected for each waste medium per day of sampling for quality control purposes.

2.1.2 Field Data and Observations

Daily field reports will be prepared onsite as work progresses. Field personnel will document observations of drum contents, waste removal and consolidation, sample collection, sampling activities, equipment calibration, personnel involved, and any other pertinent data that might affect analytical data quality.

2.1.3 Laboratory Data

The soil and liquid samples will be analyzed by a State-certified laboratory for the constituents detected by previous investigations at the Site, which are as follows:

- PCBs using EPA Method 8080,
- Volatile organics using EPA Method 8260,
- Semivolatile organics and polynuclear aromatic hydrocarbons using EPA Method 8270, and
- Title 26 metals using EPA Method 6010/7000.

Samples with total volatile organics in excess of 1,000 milligrams per kilogram (mg/kg) will also be analyzed for ignitability using EPA Method 1010. The soil and liquid samples that are assessed to have the highest concentrations of chemical constituents will be analyzed for acute aquatic toxicity by bioassay.

Samples with analytes regulated by the Toxicity Characteristic rule that have organic concentrations detected at greater than State-action levels or metal concentrations greater than Total Threshold Limit Concentrations (TTLC) will be analyzed by the Toxicity

Characteristic Leaching Procedure (TCLP) and the Waste Extraction Test (Soluble Threshold Limit Concentration [STLC]).

Analyses will also be performed to determine pH (hydrogen ion activity) by EPA Method 9040, and reactivity by EPA Methods 9010 (cyanide) and 9030 (sulfides).

Laboratory data will be validated in accordance with the Standards for Data Validation presented in the 1990 draft California Environmental Protection Agency (Cal-EPA) (formerly the California Department of Health Services) guidance document: Scientific and Technical Standards for Hazardous Waste Sites - Volume 1, Chapter 2.

2.2 WASTE CLASSIFICATION

A waste profile will be prepared for the soil and liquid wastes at the Site so that safe, legal, and economic handling and disposition of the wastes will occur. Classification of the waste will be accomplished by following the appropriate Federal and State regulations and guidelines.

2.2.1 Criteria

2.2.1.1 Federal Criteria

In accordance with 40 Code of Federal Regulations (CFR) Part 260, Appendix I, and 40 CFR Part 261, an evaluation will be performed to determine whether the wastes are subject to regulation under Subtitle C of the Resources Conservation Recovery Act (RCRA), as administered by the U.S. Environmental Protection Agency (EPA). Specifically, the laboratory analyses will be reviewed to classify the waste on the basis of the characteristics of ignitability, corrosivity, reactivity, and toxicity (Part 261, Subpart C).

2.2.1.2 State of California Criteria

In accordance with Article 2 of 22 California Code of Regulations (CCR), Section 66305, an evaluation will be made as to whether the Site materials should be classified as California hazardous (or extremely hazardous) waste under Article 9, Article 10, and Article 11 of 22 CCR.

Restricted wastes are defined by specific chemical concentrations listed in Article 15 of 22 CCR. Restricted hazardous wastes may not be discharged to any waste management unit until they have been treated to reduce their threat to public health and the environment.

California also classifies certain nonhazardous wastes as "designated wastes" (23 CCR) if they contain pollutants that could be released at concentrations in excess of applicable water quality objectives or that would cause degradation of waters of the State. The analytical results will be reviewed to assess whether any wastes should be considered to be designated wastes.

2.2.2 Waste Classification Report

HLA will summarize the waste sampling and analysis in a Waste Classification Report for review and approval by the DTSC. The report will describe the waste consolidation and sampling activities. It will also include reports of all laboratory analyses. The report will discuss the number of drums at the Site and their contents, results of waste sampling, waste profiling and classification rationale, and disposal/storage options chosen.

2.3 WASTE DISPOSAL/STORAGE OPTIONS

This section presents waste disposal/storage options and procedures that are believed to be appropriate for the drums at the Site based on the available analytical data from prior Site investigations. The options and procedures will be confirmed following review of the waste sampling and analysis data. Drum removal activities will comply with all applicable regulatory requirements.

2.3.1 Disposal/Storage Options

Potential waste disposal/storage options as well as potential disposal facilities are presented in Table 2. All oil/sludge and aqueous wastes, used PPE and miscellaneous debris, and empty drums will be transported offsite for disposal, resource recovery, or recycling. The facility to be used will depend upon the type of waste, hazardous classification, cost of disposal and regulatory status of the waste facility. Investigation-derived wastes, consisting of soil from previous investigations, may be stored onsite if it appears to be more efficient to remove/remediate them later during Site remediation.

Storage will require that the investigation-derived wastes be placed in a secure area, stabilized, and managed. This option would be viable if laboratory analytical results and mitigation measures (for example, covered bins within fenced areas) indicate that storage of the wastes would present little risk to human health and/or the environment (EPA, 1992).

2.3.2 Disposal/Storage Procedures

Any drums remaining after waste consolidation, sampling, and analyses (such as drums containing personal protective equipment) will be loaded onto trucks for offsite disposal. Empty drums will be removed from the Site for crushing and recycling or disposal. If removed from the Site, bins containing solid wastes will be sealed and transported by truck. If stored onsite, the bins will be placed in an earth-bermed area lined with an impermeable membrane, asphalt, or concrete. The storage area would be fenced with a locked gate.

Certificates of waste destruction/disposal will be requested from each offsite facility used. The facility will return a copy of the transportation/disposal manifest with a letter of disposal attached. Completed disposal manifests will display the signature of a representative of the receiving facility. The waste transporter will send a copy of the transportation manifest to the generator's agent or designee after delivery of the waste. Straight bills of lading, California nonhazardous designated waste manifests, and any weight tickets from the waste hauler and disposal facility will be requested, as appropriate.

2.3.3 Transportation Procedures

An EPA identification number is required for storage, handling, transport, and disposal of all hazardous and designated wastes. This ID number is also required on all waste data sheets. The EPA ID number for use during all waste disposal from the Site will be supplied by Mr. Walker. The California Board of Equalization (BOE) number is a State of California hazardous waste tax ID number that is required for all disposal of hazardous waste generated in or disposed of in California. The BOE number is not required for approval of wastes to disposal facilities; however, it is required on all manifests. The BOE number for use on all hazardous or designated waste transported offsite will be supplied by Walker.

Hazardous waste manifests will be prepared and signed by a designee of Mr. Walker. Manifests will be prepared for both RCRA wastes and California-designated wastes. The transportation and disposal of California nonhazardous waste will be documented on a nonhazardous waste manifest. Bills of lading will be used for nonhazardous and nondesignated wastes. A log will be maintained of all manifests and bills of lading.

All hazardous waste will be transported by a licensed waste hauler. All haulers will be registered and in good standing with the U.S. Department of Transportation (DOT) and California Highway Patrol. All loaded transport vehicles will be checked for proper documentation, load safety, and proper DOT markings and containers prior to leaving the Site.

Traffic routes for transporters will be selected to avoid, if possible, schools and residential areas. When specific waste removal and hauling plans are finalized, a public information fact sheet will be prepared and submitted to the DTSC for review. The DTSC-approved fact sheet will be mailed to the public for 5-day public review period to allow for public comment prior to the start of waste removal. Approved route maps will be supplied to all transporters. The anticipated travel route from the Site to U.S. Interstate 5 is shown on Plate 3.

Route maps from the site to the selected treatment, storage, or disposal facility; communication and notification mechanisms for local emergency response organizations with jurisdiction along transportation routes; and a discussion of the transportation mode including the types of vehicles to be used, loading and unloading methods, placarding requirements, and capacity of each vehicle, will be provided after evaluation and selection among waste disposal/storage options.

2.3.4 Health and Safety Plan

A Health and Safety Plan (HSP) (Appendix A) has been prepared so that all field personnel will be informed of the potential hazards at the site. All field personnel and site visitors will follow the guidelines, rules, and procedures contained in the HSP.

2.3.5 Completion Report

A summary completion report will be prepared describing removal/storage activities, Site conditions, and disposition of all materials removed from the Site or stored for later disposition.

2.4 CONTINGENCY PLAN

An Emergency Coordinator or designated alternate will have the authority to direct onsite resources in the event of an accident involving a transport vehicle. The coordinator will also have authority to call response agencies, including police, fire, and hazardous materials crews and will have the ability to maintain radio contact with all transport vehicles or their dispatcher.

The Emergency Coordinator will be responsible for knowing the hazards associated with the various wastes handled, assess the impact of these hazards in the event of a transport accident, and establish a cooperative procedure with emergency officials along the transportation route. In the event of an accident, the Emergency Coordinator will promptly notify the appropriate emergency officials along the transport route. The coordinator will

brief the officials on the extent of the emergency and any hazards pertinent to the incident and will prepare a report after the cessation of the emergency detailing the cause of the emergency and response actions taken.

A preliminary emergency notification list is given below. The list will be completed when transportation routes are finalized:

Agency/Company	Purpose	Telephone
Los Angeles County	Sheriff	911 or 310/363-8711
Santa Fe Springs	Fire	911 or 310/868-1711
Norwalk Community Hospital	Medical	911 or 310/863-4763
Texaco		
• Christine Bathker	Project Manager	818/505-2732
HLA		
• Donald Quigley	Incident Reporting	714/556-7992
• Gregory Albright	Health and Safety	714/556-7992
• Heriberto Robles	Health and Safety (Incident Reporting)	714/556-7992

Agency/Company	Purpose	Telephone
Agency Contact		
• Los Angeles County Environmental Management Services	Spill Reporting	310/907-3220 or 213/974-1234 (Emergency)
• Hazmat Control Unit (Los Angeles County Fire Department)	Spill Reporting	911 (Emergency)
• State Office of Spill Reporting Emergency Services	Spill Reporting	800/852-7550
• National Response Center	Spill Reporting	800/424-8802
• Cal/OSHA Los Angeles	Injury/Death	310/944-7676

3.0 SCHEDULE OF WORK

The following schedule of activities is anticipated to accomplish drum removal:

Activity	Cumulative Time to Complete*
Waste Sampling and Analysis	4 weeks
Waste Classification and Report	8 weeks
Implementation of Waste Disposal/Storage	12 weeks
Completion Report	16 weeks

* After approval of this Drum Removal Plan by the DTSC

REFERENCES

TRC Environmental Consultants, Inc.; 1990; Preliminary Endangerment Assessment Report, Walker Properties, Santa Fe Springs, California, Los Angeles County; July 12.

United States Environmental Protection Agency; 1992; Guide to Management of Investigation-Derived Wastes - Publication No. 9345.3-03FS; January.

TABLES

Table 1. Chemical Constituents

Environmental Medium	Chemical	Maximum Detected Concentration
Soil	PCBs	248 ppm
	Lead	2,470 mg/kg
	Barium	2,520 mg/kg
	Copper	5,140 mg/kg
	1,1,1-TCA	9.7 mg/kg
	1,1-DCA	4.4 mg/kg
	TCE	32 mg/kg
	PCE	12 mg/kg
	Benzene	11.5 mg/kg
	Penanthrene	4.5 mg/kg
	TPH (gasoline)	3,350 mg/kg
	TPH (jet fuel)	12,000 mg/kg
	TPH (oils)	150,000 mg/kg
Insulation	Asbestos	40% Chrysotile
		25% Amosite
Groundwater	1,1-DCA	8.3 ug/l
	1,1-DCE	0.6 ug/l
	trans-1,2-DCE	20 ug/l
	cis-1,2-DCE	13 ug/l
	Bromodichloromethane	1.0 ug/l
	Vinyl Acetate	2.7 ug/l
	Vinyl Chloride	75 ug/l
	Benzene	1,800 ug/l
	Ethylbenzene	1,800 ug/l
	Toluene	300 ug/l
	Xylenes	2,000 ug/l

Notes:

ppm = parts per million
mg/kg = milligrams per kilogram
ug/l = micrograms per liter
PCB = polychlorinated biphenyls
TCA = trichloroethane
DCA = dichloroethane
TCE = trichloroethane
PCE = tetrachloroethene
TPH = total petroleum hydrocarbons
DCE = dichloroethene

Table 2. Waste Disposal/Storage Options

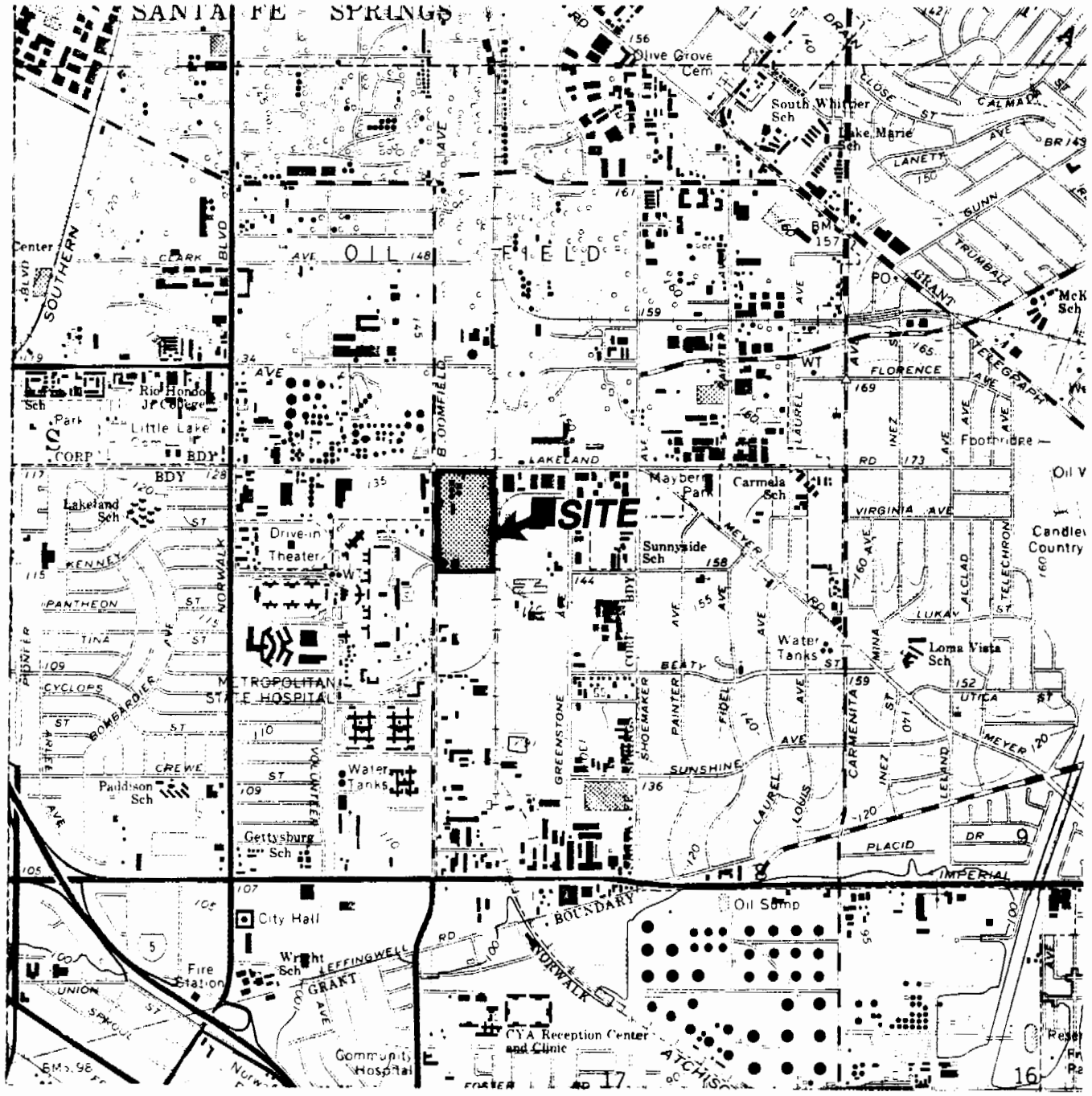
Waste	Classification	Disposal/Storage Option	Facility
Oil/Sludge	RCRA or California Hazardous	Resource Recovery Stabilization/Landfill Incineration	SYSTECH, California USE, Nevada Rollins, Texas
	Nonhazardous (California designated)	Resource Recovery Stabilization/Landfill	SYSTECH, California USE, Nevada
Soil	California Restricted	Incineration	Rollins, Texas
	Nonhazardous (California designated)	Landfill	Laidlaw, California CWM, California
	Investigation-Derived Waste	Onsite Storage	
Aqueous	Nonhazardous (California designated)	Solar Evaporation	Laidlaw, California CWM, California
		Treatment/Recycle	DK, California C&O, California Gibson, California
	RCRA Hazardous	Solar Evaporation	Laidlaw, California CWM, California
		Treatment/Recycle	DK, California C&O, California Gibson, California
Used PPE & Misc. Debris	RCRA Hazardous	Incineration	Rollins, Texas
Empty Drums	Nonhazardous	Landfill Recycle	Laidlaw, California CDC, California

Notes:

CWM = Chemical Waste Management
USE = US Ecology
DK = Demmeno Kerdoon
C&O = Crosby and Overton
CDC = Cooper Drum Company

ILLUSTRATIONS

HDL\21691\92-1\VICMAP1



Reference: USGS 7.5-minute quadrangle, Whittier, California (photorevised 1981).

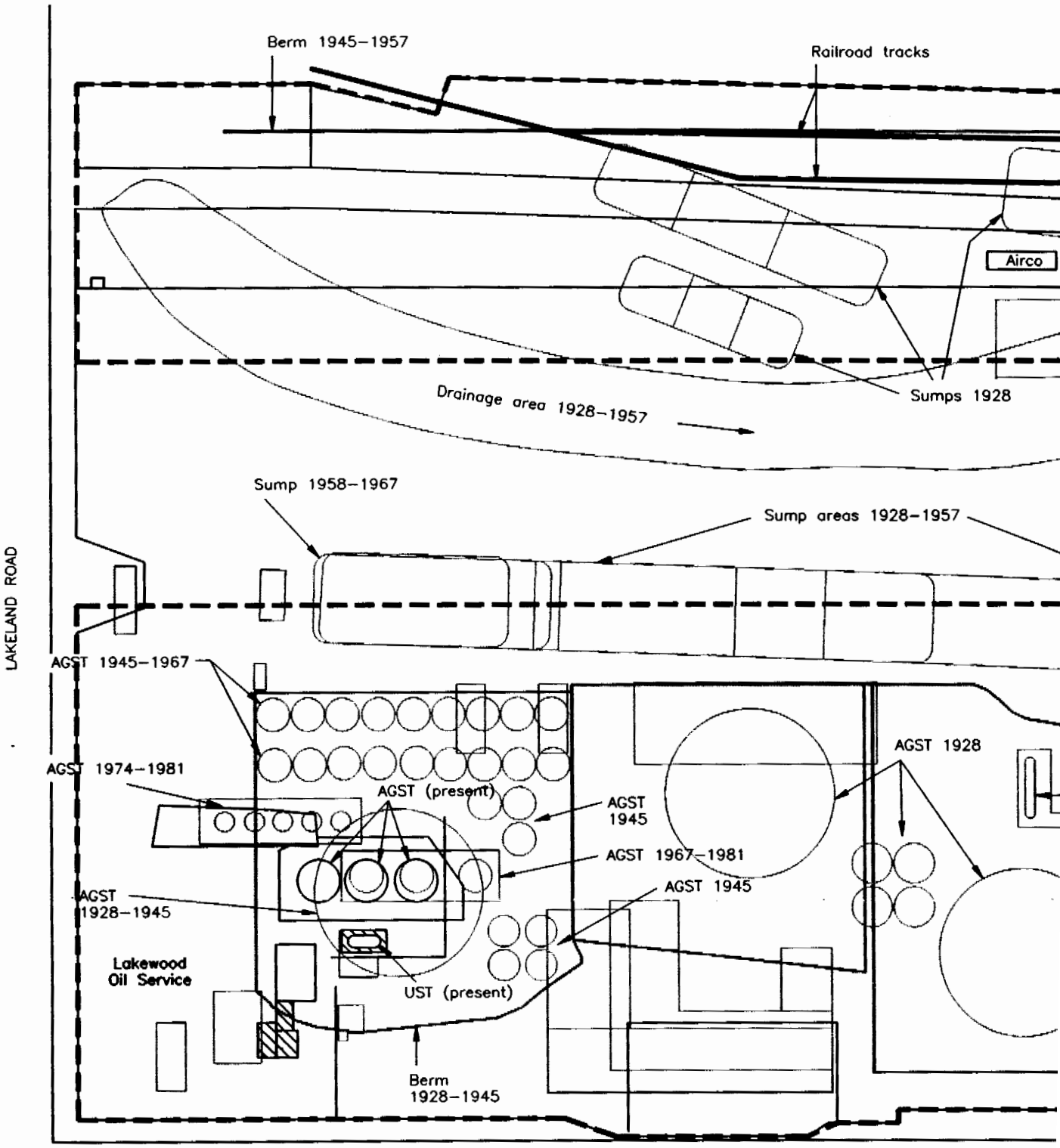
PLATE

1

Harding Lawson Associates
Engineering and
Environmental Services

VICINITY MAP
Walker Property Site
Santa Fe Springs, California

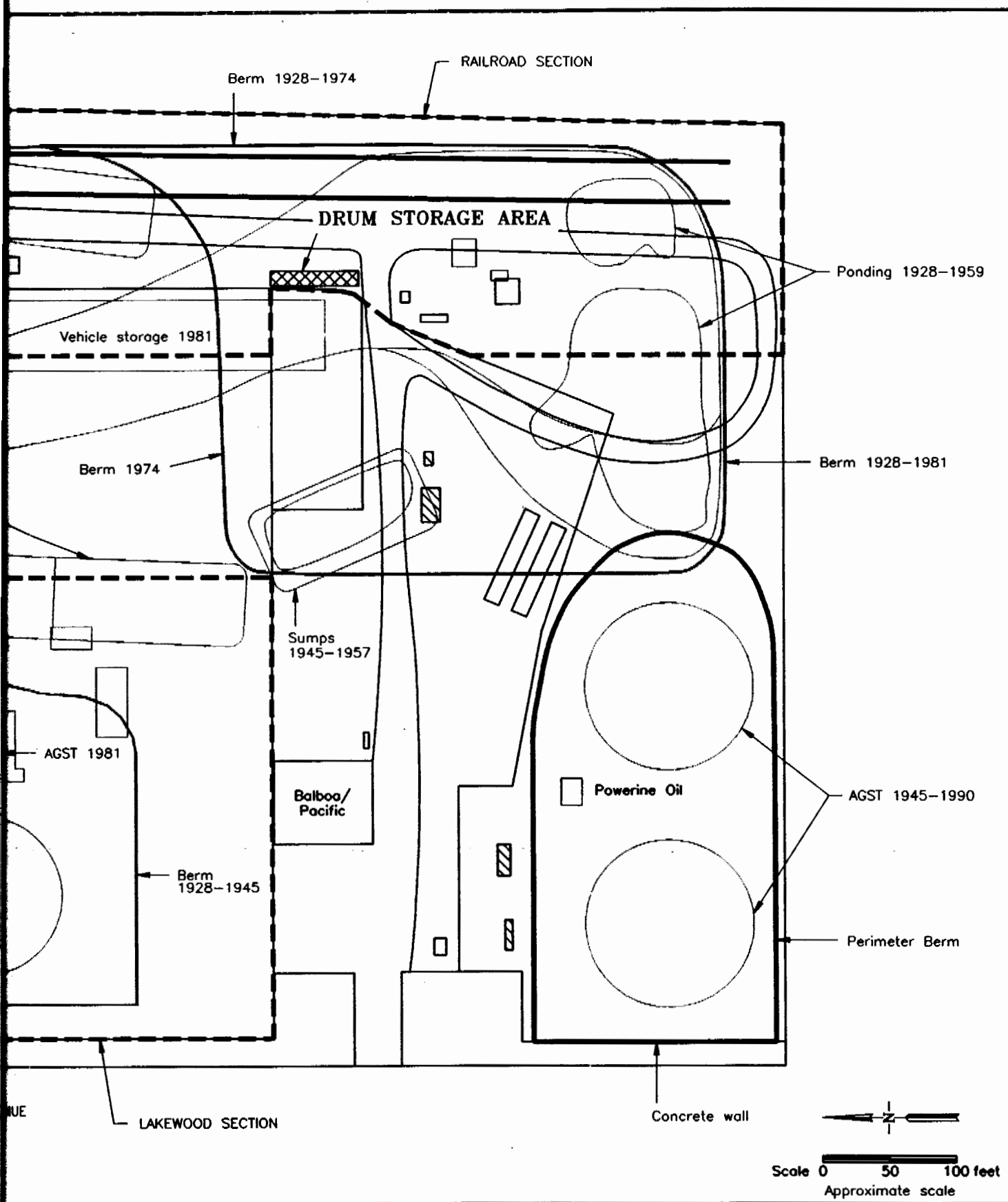
DRAWN	PROJECT-TASK NUMBER	APPROVED	DATE	REVISED	DATE
LJH	22263-1	GKA	12/92		



EXPLANATION

———	Existing
———	Previous
AGST	Aboveground storage tank
UST	Underground storage tank
▨	Concrete pads
▩	Drum storage area

Note: Dates from historical aerial photograph representation from TRC (1990).



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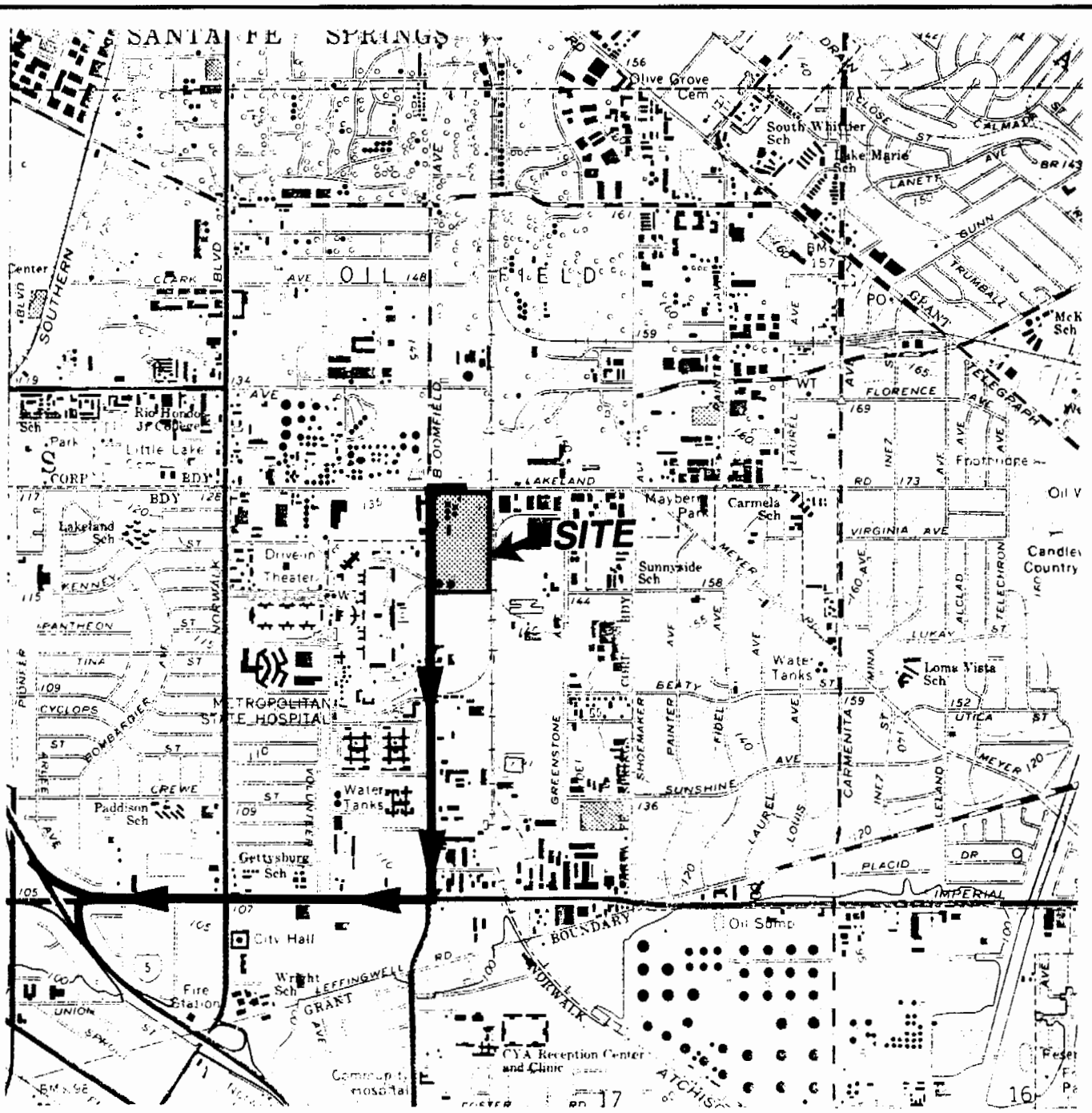
Engineering and
Environmental Services

SITE PLAN
Walker Property Site
Santa Fe Springs, California

PLATE
2

DRAWN	PROJECT-TASK NUMBER	APPROVED	DATE	REVISED	DATE
LJH	22263–1	GRA	12/92		

HDA\21691\92-1\VICMAP2



SCALE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

N

Reference: USGS 7.5-minute quadrangle, Whittier, California (photorevised 1981).

PLATE

3

Harding Lawson Associates
Engineering and
Environmental Services

TRANSPORTATION ROUTE

Walker Property Site
Santa Fe Springs, California

DRAWN	PROJECT-TASK NUMBER	APPROVED	DATE	REVISED	DATE
LJH	22263-1	GRA	12/92		

APPENDIX A

APPENDIX A

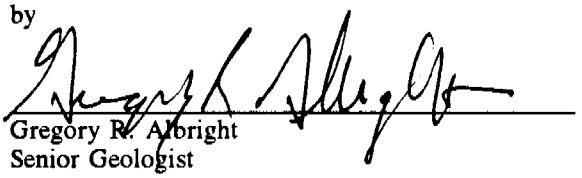
HEALTH AND SAFETY PLAN

A Health and Safety Plan Prepared for:

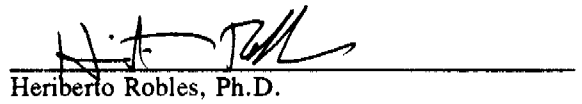
Texaco, Inc.
10 Universal City Plaza
Universal City, California 91608-7812

HEALTH AND SAFETY PLAN
Walker Property Site
Santa Fe Springs, California
HLA Project No. 22263-1

by



Gregory R. Albright
Senior Geologist



Heriberto Robles, Ph.D.
Associate Toxicologist

Harding Lawson Associates
3 Hutton Centre Drive, Suite 200
Santa Ana, California 92707
(714) 556-7992

12/21/92

ALL PERSONNEL PARTICIPATING IN FIELD ACTIVITIES MUST BE TRAINED IN THE GENERAL AND SPECIFIC HAZARDS UNIQUE TO THIS JOB AND MEET MEDICAL EXAMINATION REQUIREMENTS. ALL SITE PERSONNEL AND VISITORS SHALL FOLLOW THE GUIDELINES, RULES, AND PROCEDURES IN THIS DOCUMENT. THE PROJECT MANAGER OR SITE SAFETY OFFICER MAY IMPOSE ANY OTHER PROCEDURES OR PROHIBITIONS JUDGED NECESSARY FOR SAFE OPERATIONS.

THIS DOCUMENT IS PREPARED TO INFORM ALL FIELD PERSONNEL, INCLUDING HLA CONTRACTORS AND HLA SUBCONTRACTORS, OF POTENTIAL HAZARDS ONSITE. HOWEVER, EACH CONTRACTOR OR SUBCONTRACTOR MUST ASSUME DIRECT RESPONSIBILITY FOR THE HEALTH AND SAFETY OF ITS OWN EMPLOYEES.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF ILLUSTRATIONS

A. INTRODUCTION

1. **SITE LOCATION:** Southeast corner of Bloomfield Ave. & Lakeland Rd., Santa Fe Springs, CA

2. **PLAN PREPARED BY:** _____ 03-15-93
Gregory R. Albright, Senior Geologist (Date)

3. **PLAN APPROVED BY:** _____ 3/15/93
Donald W. Quigley, Project Manager (Date)

_____ 3-15-93
Heriberto Robles, DHSO (Date)

4. **PLAN REVISED BY:** _____ _____

5. **REVISED PLAN APPROVED BY:** _____ _____

_____ _____

6. **POSSIBLE HAZARDS ON THIS JOB INCLUDE THE FOLLOWING:**

- Chemical hazards from petroleum hydrocarbons
- Chemical hazards from chemicals at site
- Fall and trip hazards from structures at site
- Ergonomic hazards from moving and lifting materials at site
- Equipment (heavy) hazard

7. **REQUIRED PERSONAL PROTECTIVE ITEMS AND EQUIPMENT FOR THIS PROJECT ARE AS FOLLOWS:**

- Steel toed chemical resistant boots or overboots
- Safety glasses or chemical splash goggles
- Safety vests
- Chemical resistant gloves (Nitrile)
- Hardhat
- Cloth or Tyvek coveralls
- Half-mask respirator organic vapor cartridge (if necessary)

B. KEY PROJECT PERSONNEL AND ASSOCIATED HEALTH AND SAFETY RESPONSIBILITIES

1. **PROJECT MANAGER**: Donald W. Quigley, P.E.

Health and Safety Responsibilities: Acquaint field personnel with potential hazards. Make available proper PPE, adequate time and budget, and qualified personnel to perform site work in a safe manner.

2. **SITE SUPERVISOR**: Gregory R. Albright, R.G.

Health and Safety Responsibilities: Ensure that all field personnel have read and signed the master copy of this document. Check that all site personnel meet Occupational Safety and Health Administration (OSHA) requirements regarding training, medical examinations, and fit testing.

3. **SITE SAFETY OFFICER**: Gregory R. Albright, R.G., or designee

Health and Safety Responsibilities: Ensure that the guidelines, rules, and procedures in this document are followed for all site work. Be familiar with local emergency services. Conduct a tailgate health and safety meeting before work start-up and weekly thereafter. Additional meetings may be required for specific job tasks or site activities. Maintain and inspect PPE, monitor onsite hazards, and monitor the physical condition of site personnel.

4. **SUBCONTRACTORS**

To be determined

Health and Safety Responsibilities: Follow the guidelines, rules, and procedures in this document.

5. **OTHERS**: site visitors

Health and Safety Responsibilities: Follow the instructions of the Site Safety Officer (SSO), Site Supervisor, and DHSO. Follow the guidelines, rules, and procedures in this document.

The Site Safety Officer, or designee, will conduct an unannounced inspection of the worksite during one of the five tasks described in Section H. The inspection will be conducted to ensure that the guidelines, rules, and procedures in this document are followed by site personnel. An inspection checklist is included as Attachment A.

C. BACKGROUND INFORMATION

1. **SITE DESCRIPTION**: 21-acre site, now relatively vacant. Three above ground storage tanks (AGSTs) remain in the northwest corner on earthen berm/concrete wall retention - dike remain in the southwest corner.

2. **SITE HISTORY**: Site formerly used for crude-oil storage, waste-oil storage and recycling, storage/disposal of oil well drilling fluids, and storage of refined product.

3. **HAZARDOUS INCIDENCE HISTORY**: No data or history of injuries, exposures, or complaints related to the presence of petroleum contaminants is currently known.

4. **PURPOSE OF ACTIVITY/OBJECTIVE OF HLA'S WORK**: Inspection of drums containing investigation-derived waste, waste sampling, waste transfer and transport, and drum removal.

5. **SITE STATUS**: ____ Active __X__ Inactive ____ Unknown

6. **SURROUNDINGS**: The site is located in an industrial area. A refinery is across the street to the north.

7. CLIMATE

Average Wind Speed and Direction: 6 to 8 mph from the west

Humidity: ____ Arid __X__ Semiarid ____ Humid ____ Tropical

	July	October	January	April
Mean High Temperature	89°F	81°F	66°F	73°F
Mean Low Temperature	61°F	53°F	44°F	48°F

D. IDENTIFIED CHEMICAL CONTAMINANTS

1. CHEMICAL CONTAMINANTS KNOWN TO BE PRESENT:
(Refer to Table 1 for hazardous property information)

Environmental Medium	Chemical	Maximum Detected Concentration
Soil	PCBs	248 ppm
	Lead	2,470 mg/kg
	Barium	2,520 mg/kg
	Copper	5,140 mg/kg
	1,1,1-TCA	9.7 mg/kg
	1,1-DCA	4.4 mg/kg
	TCE	32 mg/kg
	PCE	12 mg/kg
	Benzene	11.5 mg/kg
	Penanthrene	4.5 mg/kg
	TPH (gasoline)	3,350 mg/kg
	TPH (jet fuel)	12,000 mg/kg
	TPH (oils)	150,000 mg/kg
Insulation	Asbestos	40% Chrysotile
		25% Amosite
Groundwater	1,1-DCA	8.3 ug/l
	1,1-DCE	0.6 ug/l
	trans-1,2-DCE	20 ug/l
	cis-1,2-DCE	13 ug/l
	Bromodichloromethane	1.0 ug/l
	Vinyl Acetate	2.7 ug/l
	Vinyl Chloride	75 ug/l
	Benzene	1,800 ug/l
	Ethylbenzene	1,800 ug/l
	Toluene	300 ug/l
	Xylenes	2,000 ug/l

Notes:

ppm = parts per millon
mg/kg = milligrams per kilogram
ug/l = micrograms per liter
PCB = polychlorinated biphyenyls
TCA = trichloroethane
DCA = dichloroethane
TCE = trichloroethane
PCE = tetrachloroethene
TPH = total petroleum hydrocarbons
DCE = dichloroethene

2. ADDITIONAL CHEMICAL CONTAMINANTS SUSPECTED TO BE PRESENT ONSITE:

Chemical	Environmental Medium
None suspected	None applicable

3. CHEMICAL CONTAMINANTS CHARACTERIZATION: Extensive contaminant characterization information found in the Preliminary Endangerment Assessment (PEA) report prepared by TRC consultants dated July 12, 1990.

E. GENERAL WORK PRACTICES

GENERAL WORK PRACTICES TO BE FOLLOWED ONSITE ARE AS FOLLOWS:

- No one will be permitted to work alone inside an Exclusion Zone once established. The buddy system described in 8 CCR 5192 (a)(3) will be used during all work activities within an exclusion zone.
- Any and all drums will be initially opened under Level B protection. If conditions warrant, personnel may downgrade to Level C, modified Level D or Level D.
- Smoking, eating, drinking, gum chewing, or tobacco chewing will not be permitted in the work zones.
- Personnel should monitor weather conditions, particularly wind direction, because they could affect potential exposure.
- Personnel should be alert to any abnormal behavior of other workers that may indicate distress, disorientation, or other ill effects.
- Personnel should never ignore symptoms that could indicate potential exposure to chemical contaminants. These symptoms should be reported immediately to the employees' supervisor or the Site Safety Officer.
- Use of equipment that may generate a spark is not permitted at sites where the potential presence of explosive gases is suspected. At these sites an explosimeter (specific to the potential explosive gas) must be used.

F. SITE CONTROL/WORK ZONES

1. **SITE CONTROL/SECURITY MEASURES**: Site perimeter is secured by a chain-link fence topped with barbed wire and has pad locked gates. Site entry will be permitted only to those on project related business.

   A warning sign will be posted at the former AIRCO CO_2 processing area. As per 8 CCR 5208 (m)(1)(A), the regulated asbestos hazard area warning sign will state:

   DANGER
   ASBESTOS
   CANCER AND LUNG DISEASE HAZARD
   AUTHORIZED PERSONNEL ONLY
   RESPIRATORS AND PROTECTIVE CLOTHING
   ARE REQUIRED IN THIS AREA

2. **WORK ZONES**: Present work zone is the drum storage area. Entry will be restricted to those with valid certificates of training per Cal/OSHA Regulation 8 CCR 5192.

3. **SITE SAFETY PLAN LOCATIONS**: Copies of the Site Safety Plan (SSP) will be located onsite in the HLA onsite vehicle.

Table 2: **HAZARD ANALYSES**

List all activities in the Job Task column and assign a number to each activity (e.g., 1. Groundwater Sampling). Identify how each category of hazard exists at each activity. See example hazard analyses in Appendix B.

Activity Number	Job Task	Mechanical	Electrical	Chemical	Temperature	Acoustical	Radioactive	O2 Deficiency Confined Space	Biohazard
1	Drum Inspection	N/A	storms	onsite contamination	hot surfaces env. extremes	N/A	N/A	N/A	airborne dust
2	Waste Classification Screening	N/A	storms	onsite contamination	hot surfaces env. extremes	N/A	N/A	N/A	airborne dust
3	Empty Drums	heavy equipment	storms	onsite contamination	hot surfaces env. extremes	N/A	N/A	N/A	airborne dust
4	Waste Sampling	N/A	storms	onsite contamination	hot surfaces env. extremes	N/A	N/A	N/A	airborne dust
5	Drum Removal	N/A	storms	onsite contamination	hot surfaces env. extremes	N/A	N/A	N/A	airborne dust

N/A = Not Applicable

Hazard		Task	Exposure[1]	Probability[2]	Consequence[3]
Mechanical	- Drill rig, compressor, generator, pump	Monitoring-well installation, aquifer testing	CONT	UNU	MIN-FATAL
Electrical	- Power lines	Monitoring-well installation, soil sampling, aquifer testing	OCC	UNU	MOD-FATAL
Electrical	- Storms	All tasks	OCC	UNU	MOD-FATAL
Chemical	- Toxins in air	Aquifer testing, monitoring-well installation, ground-water sampling, soil sampling, water-level measurements	FREQ	UNU	CHRON-SER
Chemical	- Toxins in water	Water-level measurements, monitoring-well installation, ground-water sampling, aquifer testing	FREQ	UNU	CHRON-MIN
Chemical	- Toxins in soil	Monitoring-well installation, soil sampling	FREQ	UNU	CHRON-MIN
Temperature	- Heat stress	All tasks	FREQ	LIKE	MIN-FATAL
Temperature	- Cold stress	All tasks	FREQ	LIKE	MIN-FATAL
Acoustical	- Drill rig, pump, generators, compressor	Monitoring-well installation, ground-water sampling, soil sampling, aquifer testing	CONT	UNU	CHRON
Biohazard	- Poisonous insects	All tasks	CONT	LIKE	MIN-FATAL

[1] Exposure: The frequency of exposure to the hazardous event
- a. CONT — Continuously - many times daily
- b. FREQ — Frequently - once/day or twice/day
- c. OCC — Occasionally - once/week to once/month
- d. SELD — Seldom - Once/month to once/year

[2] Probability: The likelihood that an injury will occur upon exposure to the hazardous event
- a. CERT — Certain or almost certain
- b. LIKE — Likely, not unusual, 50/50 chance of occurring
- c. UNU — Unusual, would happen less often than not
- D. IMP — Improbable, not likely to happen

[3] Consequence: The degree of injury resulting from exposure to the hazardous event if any injury occurs
- a. FATAL — Fatality
- b. SER — Serious injury, including chemical exposure requiring hospitalization
- c. MOD — Moderate injury, including chemical exposure requiring outpatient medical treatment
- d. MIN — Minor injury, including chemical exposure, requiring onsite first aid
- e. CHRON — Chemical, acoustical, or other exposure above TLV or other recommended standard that may not produce immediate acute effect (especially chronic toxicants)

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Table 1. Hazardous Property Information
(Page 1 of 6)

Compound	Water Solubility[a]	Specific Gravity	Vapor Density	Flash Point (°F)[c]	Vapor Pressure[d]	LEL UEL	TLV-TWA[g]	IDLH Level	Hazard Properties[j]	Acute Exposure Symptoms[k]
VOLATILE ORGANIC PRIORITY POLLUTANTS										
Acrolein	22%	0.8410	1.9	-15	214 mm	2.8% 31%	0.1 ppm	5 ppm	BCED	ABDFGHIKLMNO-PQR
Acrylonitrile	7.1%	0.8060	1.8	30	83 mm	3% 17%	2 ppm	4000 ppm	BCEGO	FGIKLMNOR
Benzene	820 ppm	0.8765	2.8	12	75 mm	0.339% 7/1%	1 ppm	2000 ppm	BCGO	BCDFHIKLMNOQR
Bromomethane	0.1 g	1.732	3.3	None	1.88 atm	13.5% 14.5%	5 ppm[b]	2000 ppm	CD	BCDEIJKLMNOQR
Bromodichloromethane	Insoluble	1.980	N/I	None	N/A	NF	None established	None specified	CGO	BIMN
Bromoform	0.01 g	2.887	N/I	None	5 mm	NF	0.5 ppm	N/A	CED	BCDKLM
Carbon tetrachloride	0.8%	1.5967	5.3	None	91 mm	NF	5 ppm[b]	300 ppm	CD	ABCFGHKMO
Chlorobenzene	0.01 g	1.1058	3.9	84	8.8 mm	1.3% 9.6%	75 ppm	2400 ppm	BCD	BCFIKLMNOPQR
Chloroethane	0.6 g	0.8978	2.2	-58	1.36 atm	3.8% 15.4%	1000 ppm	20,000 ppm	BCD	BFHIKMNP
2-Chloroethylvinyl ether	Insoluble	1.0475	3.7	80	30 mm	N/I	None established	None specified	BCD	NIM
Chloroform	0.8 g	1.4832	4.12	None	160 mm	NF	10 ppm[b]	1000 ppm	CD	BCDGIKLMN
Chloromethane	0.74%	0.9159	1.8	32	50 atm	7.6% 19%	50 ppm[b]	10,000 ppm	BCD	ABCDEFGIJKLOQR
Dibromochloro-methane	Insoluble	2.451	N/I	N/I	N/I	N/I	None established	None specified	BCD	BFHIMNPQ
1,1-Dichloroethane (DCA)	0.1 g	1.1757	8.4	22	182 mm	6% 16%	100 ppm	4000 ppm	BCD	AGHIMNO

Compound	Water Solubility[a]	Specific Gravity	Vapor Density	Flash Point (°F)[c]	Vapor Pressure[e]	LEL UEL	TLV-TWA[g]	IDLH Level	Hazard Properties[j]	Acute Exposure Symptoms[k]
1,2-Dichloroethane	0.8%	1.2554	3.4	55	87 mm	6.2% 16%	10 ppm[h]	1000 ppm	BCDG	BCFGOLMNQ
1,1-Dichloroethylene (DCE)	2250 mg/l	N/I	3.4	3	591 mm	7.3% 16.0%	5 ppm[h]	None specified	BCD	BIMN
trans-1,2-Dichloro-ethylene	Slightly soluble	1.2565	N/I	36	400 mm	9.7% 12.8%	None established	None specified	BCD	ABFILOQ
1,2-Dichloropropane	0.25%	1.583	3.9	60	40 mm	3.4% 14.5%	75 ppm	2000 ppm	BCD	ABGHIKMNO
cis-1,3-Dichloropropane	Insoluble	1.2	3.8	83	28 mm	5% 14.5%	1 ppm[h]	None specified	BCD	ABGIKLMNP
trans-1,3-Dichloro-propane	Insoluble	1.2	3.8	83	28 mm	5% 14.5%	1 ppm[h]	None specified	BCD	ABGIKLMNP
Ethylbenzene	0.015 g	0.867	3.7	59	7.1 mm	1.0% 6.75	100 ppm	2000 ppm	BCD	ABFHIKLMNPQR
Methylene chloride	Slightly soluble	1.335	22.9	None	340 mm	12% Not available	100 ppm[h]	5000 ppm	CED	BCIKLMNPR
1,1,2,2-Tetrachloroethane	0.19%	1.5953	5.8	None	5 mm	NF	1 ppm[h]	150 ppm	CD	ABCFHIKLMNOQ
Tetrachloroethylene	0.15 g/ml	1.6227	5.8	None	15.8 mm	NF	50 ppm[h]	500 ppm	CD	ACFHIKLMNP
1,1,1-Trichloro-ethane (TCA)	0.7 g	1.3390	4.6	None	100 mm	8.0%[c] 10.55	350 ppm	1000 ppm	BCED	ABEDHIKLNOP
1,1,2-Trichloroethane	0.45	1.4397	4.6	None	19 mm	6%[c] 15.5%	10 ppm	500 ppm	C	DEFGHIKMNOPQ
Trichloroethylene (TCE)	0.1%	1.4642	4.5	—[d]	48 mm	12.5%	50 ppm[h]	1000 ppm	BC	BFKLNOPQ
Trichlorofluoromethane	0.11 g	1.494	N/I	None	0.91 atm	NF	1000 ppm	10,000 ppm	CD	BFHKLQ

Compound	Water Solubility[a]	Specific Gravity	Vapor Density	Flash Point (°F)[c]	Vapor Pressure[e]	LEL UEL	TLV-TWA[g]	IDLH Level	Hazard Properties[j]	Acute Exposure Symptoms[k]
Toluene	0.05 g	0.866	3.2	40	22 mm	1.3% 7.1%	100 ppm	2000 ppm	BC	DEFHIKLMNOPQ
Vinyl chloride	Negligible	0.9100	2.24	-108	3.31 atm	3.6% 33%	1 ppm	None specified	BCEG	ABFHIKLMN
METALS										
Arsenic	—[b]	5.727	N/A	None	N/A	—[f]	10 $\mu g/m^3$	None specified	CEG	ACDGJMOQR
Beryllium	—[b]	1.85	N/A	None	N/A	—[f]	2 $\mu g/m^3$	None specified	C	IJMNR
Cadmium	—[b]	8.642	N/A	None	N/A	—[f]	0.5 mg/m^3	40/mg^3	C	ABGHIKLMNQR
Chromium	—[b]	7.20	N/A	None	N/A	—[f]	0.5 $mg/m^{3(h)}$	500/mg^3	C	FMNQ
Copper	—[b]	8.92	N/A	None	N/A	—[f]	0.1 mg/m^3	None specified	C	FGIJMOQR
Lead	—[b]	11.3437	N/A	None	N/A	—[f]	50 $\mu g/m^3$	None specified	C	ACDFGKOQR
Mercury	—[b]	13.5939	7.0	None	0.0012 mm	—[f]	50 $\mu g/m^{3(h)}$	28 mg/m^3	C	AGLMNQ
Nickel	—[b]	8.9	N/A	None	N/A	—[f]	1 mg/m^3	None specified	C	DGHLMNQ
Silver	—[b]	10.5	N/A	None	N/A	—[f]	0.01 mg/m^3	None specified	C	IN
Thallium	—[b]	11.85	N/A	None	N/A	—[f]	0.01 mg/m^3	20 mg/m^3	C	ABGLNOQ
Zinc	—[b]	7.14	N/A	None	N/A	—[f]	None established	None specified	C	DF
MISCELLANEOUS										
Asbestos	Insoluble	2.5	N/A	None	N/A	NF	0.2-2 fibers/cc	None specified	CG	MN
Cyanides	58-72%	N/I	N/A	None	N/A	NF	5 mg/m^3	None specified	CE	FKLMPQ

Compound	Water Solubility[a]	Specific Gravity	Vapor Density	Flash Point (°F)[c]	Vapor Pressure[e]	LEL UEL	TLV-TWA[g]	IDLH Level	Hazard Properties[j]	Acute Exposure Symptoms[k]
Polychlorinated biphenyls	Slightly Soluble	N/I	N/A	None	N/A	NF	1.0 µg/m³[x(i)]	None specified	CG	CHLPQ
Phenol	8.4%	1.0576	3.2	175	0.36 mm	1.8% 8.6%	5 ppm	100 ppm	C	ABCDGIKMNOQR
Xylene	0.00003%	0.8642	3.7	84	9 mm	1.1% 7%	100 ppm	10,000 ppm	BCD	ABFHIKLMNPQ
Acetone	Soluble	0.8	2.0	-4	400 mm	2.6% 12.8%	750 ppm	10,000 ppm	BCD	H
Chromic acid	Soluble	1.67-2.82	N/A	N/A	N/A	NF	None established	None specified	ACEG	GIH
Diesel fuel	Insoluble	0.81-0.90	N/I	130	N/I	0.6-1.3 6-7.5	None established	None specified	BC	IN
Gasoline	Insoluble	0.72-0.76	3.4	-45	Variable	1.4% 7.6%	300 ppm	None specified	CD	IN
Kerosene	Insoluble	0.83-1.0	N/I	100-165	5	0.7% 5.0%	None established	None specified	BCD	IN

°F = degrees Fahrenheit
µg/m³ = micrograms per cubic meter
atm = atmospheres
g = gram
g/ml = grams per milliliter
IDLH = immediate danger to life and health
LEL = lower explosive limit
mg³ = cubic milligrams
mg/l = milligrams per liter
mg/m³ = milligrams per cubic meter
mm = millimeters
N/A = not applicable

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NF = nonflammable
N/I = no information is available
ppm = parts per million
UEL = upper explosive limit

[a] Water solubility is expressed in different terms in different references. Many references use the term "insoluble" for materials that will not readily mix with water (e.g., gasoline). However, most of these materials are water soluble at the part per million (ppm) or part per billion (ppb) level. Gasoline, for example, is insoluble in the gross sense and found as a discreet layer on top of the ground water. But certain gasoline constituents (e.g., benzene, toluene, and xylene) are found in solution in the ground water at the ppm or ppb level.

Water solubility expressed as 0.2 g means 0.2 grams per 100 grams water at 20 degrees Celsius (°C).

[b] Solubility of metals depends on the compound in which the metals are present.

[c] Several chlorinated hydrocarbons exhibit no flash point in the conventional sense but will burn in the presence of a high-energy ignition source or will form explosive mixtures at temperatures above 200°F.

[d] Practically nonflammable under standard conditions.

[e] Expressed as milligrams of mercury (mm Hg) under standard conditions.

[f] Explosive concentrations of airborne dust can occur in confined areas.

[g] Values for PEL-TWA are Occupational Safety and Health Administration (OSHA) Permissible Exposure Limits (PELs) except where noted.

[h] TLV-TWA adopted by the American Conference of Governmental Industrial Hygienists (ACGIH), which is lower than the OSHA PEL.

[i] REL-TWA recommended by the National Institute for Occupational Safety and Health (NIOSH). (A TLV or PEL has not been adopted by ACGIH or OSHA.)

[j] Hazard properties:

A = corrosive
B = flammable
C = toxic
D = volatile
E = reactive
F = radioactive
G = carcinogen
H = infectious
I = suspected carcinogen

[k] Acute exposure symptoms

A = abdominal pain
B = central nervous system depression
C = comatose
D = convulsions
E = confusion
F = dizziness
G = diarrhea
H = drowsiness
I = eye irritation
J = fever
K = headache
L = nausea
M = respiratory system irritation
N = skin irritation
O = tremors
P = unconsciousness
Q = vomiting
R = weakness

G. SITE RESOURCES

LOCATIONS OF RESOURCES AVAILABLE TO ONSITE PERSONNEL ARE AS FOLLOWS:

Toilet facilities: Portable onsite

Drinking-water supply: Provided within truck

Telephone: Mobile phone onsite

Radio: N/A

H. HAZARD ANALYSES

This section provides (1) information regarding potential hazards that might be encountered during field activities (Table 2) and (2) a risk assessment relative to hazards identified onsite. Job tasks are identified by activity numbers as follows:

Activity Number	Job Task
1	Inspect drums
2	Waste classification screening
3	Empty drums
4	Waste sampling
5	Drum removal

Activity Description

1. Inspect drums: Drums will be inventoried to identify and document the locations and characteristics of each drum on the site. A drum characterization log will be completed for each drum as it is inspected.

2. Waste classification screening: Drums will be opened by personnel in Level B protection. Drum headspace will be monitored using organic vapor analyzers. Waste samplers will be collected for field testing and categorization.

3. Empty drums: Drums containing solid waste will be emptied into bins using either a grappler equipped backhoe or a front-end loader equipped with a sling. Drums containing liquid will be emptied using vacuum trucks. A drum will be considered empty if it contains less than one-inch of solid or liquid waste.

4. Waste sampling: Subsamples from the bins will be collected and composited for analysis at a State-certified laboratory.

5. Drum removal: Empty drums will be picked up for transportation to a drum recycler.

Table 2: **HAZARD ANALYSES**

List all activities in the Job Task column and assign a number to each activity (e.g., 1. Groundwater Sampling). Identify how each category of hazard exists at each activity. See example hazard analyses in Appendix B.

Activity Number	Job Task	Mechanical	Electrical	Chemical	Temperature	Acoustical	Radioactive	O2 Deficiency Confined Space	Biohazard
1	Drum Inspection	N/A	storms	onsite contamination	hot surfaces env. extremes	N/A	N/A	N/A	airborne dust
2	Waste Classification Screening	N/A	storms	onsite contamination	hot surfaces env. extremes	N/A	N/A	N/A	airborne dust
3	Empty Drums	heavy equipment	storms	onsite contamination	hot surfaces env. extremes	N/A	N/A	N/A	airborne dust
4	Waste Sampling	N/A	storms	onsite contamination	hot surfaces env. extremes	N/A	N/A	N/A	airborne dust
5	Drum Removal	N/A	storms	onsite contamination	hot surfaces env. extremes	N/A	N/A	N/A	airborne dust

N/A = Not Applicable

Hazard		Task	Exposure[1]	Probability[2]	Consequence[3]
Mechanical	- Drill rig, compressor, generator, pump	Monitoring-well installation, aquifer testing	CONT	UNU	MIN-FATAL
Electrical	- Power lines	Monitoring-well installation, soil sampling, aquifer testing	OCC	UNU	MOD-FATAL
Electrical	- Storms	All tasks	OCC	UNU	MOD-FATAL
Chemical	- Toxins in air	Aquifer testing, monitoring-well installation, ground-water sampling, soil sampling, water-level measurements	FREQ	UNU	CHRON-SER
Chemical	- Toxins in water	Water-level measurements, monitoring-well installation, ground-water sampling, aquifer testing	FREQ	UNU	CHRON-MIN
Chemical	- Toxins in soil	Monitoring-well installation, soil sampling	FREQ	UNU	CHRON-MIN
Temperature	- Heat stress	All tasks	FREQ	LIKE	MIN-FATAL
Temperature	- Cold stress	All tasks	FREQ	LIKE	MIN-FATAL
Acoustical	- Drill rig, pump, generators, compressor	Monitoring-well installation, ground-water sampling, soil sampling, aquifer testing	CONT	UNU	CHRON
Biohazard	- Poisonous insects	All tasks	CONT	LIKE	MIN-FATAL

[1] Exposure: The frequency of exposure to the hazardous event
- a. CONT — Continuously - many times daily
- b. FREQ — Frequently - once/day or twice/day
- c. OCC — Occasionally - once/week to once/month
- d. SELD — Seldom - Once/month to once/year

[2] Probability: The likelihood that an injury will occur upon exposure to the hazardous event
- a. CERT — Certain or almost certain
- b. LIKE — Likely, not unusual, 50/50 chance of occurring
- c. UNU — Unusual, would happen less often than not
- D. IMP — Improbable, not likely to happen

[3] Consequence: The degree of injury resulting from exposure to the hazardous event if any injury occurs
- a. FATAL — Fatality
- b. SER — Serious injury, including chemical exposure requiring hospitalization
- c. MOD — Moderate injury, including chemical exposure requiring outpatient medical treatment
- d. MIN — Minor injury, including chemical exposure, requiring onsite first aid
- e. CHRON — Chemical, acoustical, or other exposure above TLV or other recommended standard that may not produce immediate acute effect (especially chronic toxicants)

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I. HAZARD MITIGATION

PROCEDURES TO FOLLOW: The HLA Health and Safety Program (Attachment C) must be followed by all workers at the site. Procedures that will be used to minimize hazards identified onsite are listed below. The applicable activity number(s) is shown next to the procedure to mitigate the hazard. Activity numbers are as follows:

Activity Number	Job Task
1	Inspect drums
2	Waste classification screening
3	Empty drums
4	Waste sampling
5	Drum removal

Hazards not presently applicable or anticipated to ever become applicable onsite are identified by N/A.

Activity Number	Procedures to Mitigate Hazards
	1. Mechanical Hazards
1,2,3,4,5	Do not stand near backhoe buckets and earthmoving equipment.
1,2,3,4,5	Verify that all equipment is in good condition.
1,2	Do not stand or walk under elevated loads or ladders.
1,2	Do not stand near unguarded excavations or trenches.
1,2	Do not enter excavations or trenches more than 5 feet deep that are not properly guarded, shored, or sloped.
1,2	Consult the DHSO if other mechanical hazards exist.
3,4,5	Identify the equipment kill switches to all workers.
	2. Electrical Hazards
N/A	Locate and mark buried utilities before drilling or excavation.
	Utilities located by USA Alert on N/A.
N/A	Maintain at least a 10—foot clearance from overhead power lines.
N/A	Contact the utility company for information regarding minimum clearance from high-voltage power lines.
N/A	If unavoidably close to buried or overhead power lines, have power turned off, with circuit breaker locked and tagged.

1,2,3,4,5 — Properly ground all electrical equipment.

1,2,3,4,5 — Avoid standing in water when operating electrical equipment.

1,2,3,4,5 — If equipment must be connected by splicing wires, be sure all connections are properly taped, and equipment properly grounded.

1,2,3,4,5 — Be familiar with specific operating instructions for each piece of equipment.

1,2,3,4,5 — Cease drilling during electrical storms.

3. Chemical Hazards

1,2,3,4,5 — Use PPE indicated in Section K.

1,2,3,4,5 — Conduct direct-reading air monitoring to evaluate respiratory and explosion hazards (list instrument, action level, monitoring location, and action to be taken in Section J).

1,2,3,4,5 — Consult the DHSO for personal air monitoring.

N/A — Locate underground pipelines before drilling or excavation.

1,2,3,4,5 — Do not smoke, except in designated areas. Avoid using equipment with spark ignitions to limit the potential of a fire or explosion.

1,2,3,4,5 — Use fans to disperse airborne contaminants at the work site. No sparking or open flame equipment will be permitted inside the Exclusion Zone if there is a potential of reaching the Lower Explosive Limit of contaminants present at the site.

4. Temperature Hazards

a. Heat Stress

1,2,3,4,5 — When the temperature exceeds 70°F, take frequent breaks in shaded areas. Unzip or remove coveralls during breaks. Have cool water or electrolyte replenishment solution available. Drink small amounts frequently to avoid dehydration. Count the pulse rate for 30 seconds as early as possible in the rest period. If the pulse rate exceeds 110 beats per minute at the beginning of the rest period, shorten the work cycle by one—third.

b. Cold Stress

1,2,3,4,5 — Wear multilayer cold-weather clothing. The outer layer should be wind-resistant fabric.

N/A — Limit total work time in 0° to —30°F to four hours. Alternate one hour in and one hour out of the low-temperature area. Below —30°F, consult an industrial hygienist.

N/A — Drink warm fluid. Provide warm shelter for resting. Use the buddy system. Avoid heavy sweating.

5. Acoustical Hazards

3,4,5 — Use earplugs or earmuffs when noise prevents conversation in a normal voice at a distance of 3 feet.

6. O_2 Deficiency in Confined Spaces

Confined spaces include trenches, pits, sumps, elevator shafts, tunnels, or any other area where circulation of fresh air is restricted or ability to readily escape from the area is restricted. Consult the DHSO and HLA Corporate Health and Safety Policy before entering a confined space (if applicable).

N/A — Obtain a permit for confined space entry.

N/A — Monitor O_2 and organic vapors before entering. If the following values are exceeded, do not enter:

- O_2 less than 19.5 percent or greater than 25 percent.
- Total hydrocarbons greater than 5 ppm above background, if all air contaminants are not identified.
- Concentrations of specific contaminants exceeding action levels in Section J if all air contaminants are identified.

N/A — Monitor O_2 and organic vapors continuously while inside a confined space. If TLV values cited in the Hazardous Property Information appendix are exceeded, evacuate immediately. Record instrument readings.

N/A — At least one person capable of pulling workers from the confined space must be on standby outside the confined space. The observer must be trained in CPR and first aid.

N/A — Use portable fans or blowers to introduce fresh air to confined spaces whenever respirator use is required.

N/A — Work involving the use of flame, arc, spark, or other source of ignition is prohibited in a confined space.

7. O_2 Deficiency in Impoundments

N/A — Use floatation devices for pond/lagoon sampling. Use a flat-bottomed boat, which must be connected to land via a rope.

N/A — All occupants of the boat must wear life preservers. Floating seat cushions will not be substituted.

N/A — Personnel will limit movement while afloat. If movement is unavoidable, occupants will stay as low as possible while moving. Under no circumstances are personnel to stand upright while afloat.

8. Radiation Hazards

N/A — If the radiation meter indicates 2 milliroentgen per hour (mr/hr) or more, leave the area and consult the DHSO.

9. Biohazards

1,2,3,4,5 — Learn to recognize and avoid contact with poison oak or poison ivy.

1,2,3,4,5 — Do not touch infectious waste.

1,2,3,4,5 — Do not approach or agitate rabid animals.

1,2,3,4,5 — Avoid breathing dust in dry desert or central valley areas (valley fever).

1,2,3,4,5 — Use insect repellant to avoid contact with ticks, mosquitoes, and other insects (disease carriers or poisonous), as necessary.

1,2,3,4,5 — Do not touch refuse suspected of being from a biological or animal laboratory.

1,2,3,4,5 — If possible, avoid contact with poisonous snakes or other reptiles by quietly walking away. If bitten, seek medical assistance immediately.

J. AIR MONITORING

This section describes instruments and procedures that will be used for project air-monitoring activities. Decisions regarding air-monitoring activities will be made by the DHSO.

1,2,3,4,5 **1. GASES AND VAPORS:** A photoionization detector (PID) will be used to continuously monitor breathing zone concentrations of volatile organic compounds (VOCs). Calibration of monitoring equipment will be performed daily before start-up of work. Calibration gas to be used will be specific to the instrument per manufacturer instructions (Attachment B).

Action levels for known contaminants should be based on the Permissible Exposure Level (PEL) or Threshold Limit Values (TLVs) of the contaminants. Action levels for unknown contaminants are based on the following:

Instrument Reading for One Minute	Action
Background	Level D
Above background	Level D - introduce engineering controls (e.g., blower fans) and don respirator
Above background - <5 ppm above background	Level C
5 ppm above background	Level C - leave area, upgrade to Level B
5 - <500 ppm above background	Level B
500 ppm above background	Level B - leave area, upgrade to Level A
500 - 1000 ppm above background	Level A

1,2,3,4,5 **2. EXPLOSION HAZARD:** A combustible gas indicator will be used at all sites suspected of the possible presence of explosive gases (e.g., methane). Equipment calibration will be performed daily before start-up of work per manufacturer instructions (Attachment B). Calibration gas to be used will be specific to the combustible gases suspected present.

Continuous monitoring for the presence of combustible gases will be performed. If the monitoring instrument indicates the Lower Explosive Limit (LEL) is greater than 20 percent, personnel must leave the area. Fans should be used to lower the LEL. Personnel must not reenter the area until the LEL is less than 20 percent.

N/A **3. OXYGEN DEFICIENCY IN CONFINED SPACES:** Before entering a confined space, an oxygen (O_2) meter must be used to measure the oxygen concentration in air. If the oxygen concentration is less than 19.5 percent or greater than 23 percent, entry to the space is prohibited. Fans should be used to ventilate the area. If the oxygen concentration cannot be stabilized between 19.5 and 23 percent, Level B PPE must be donned to enter the confined space.

1,2,3,4 **4. FREQUENCY AND CALIBRATION:** Air and personnel monitoring will be conducted when initiating a particular activity and every 15 minutes thereafter, until completion of the activity. Both the personnel breathing zone and the general work area will be monitored. Monitoring equipment will be maintained, calibrated, and operated according to manufacturer's guidelines and recommendations. Equipment calibration will be conducted at the beginning and end of each work day. Proper maintenance, calibration, and operation of each instrument will be the responsibility of the field crew.

5. MISCELLANEOUS EQUIPMENT:

Instrument	Date of Calibration	Action Level (Breathing Zone Ambient Air)	Duration Frequency of Air Monitoring	Action
PID	daily onsite	> background	every 15 min.	Don respirator and leave area
OVA	daily onsite	> background	every 15 min.	Don respirator and leave area
Explosimeter	daily onsite	> 20% LEL	every 15 min.	Ventilate area below 20% LEL

K. REQUIRED PPE AND RELATED SAFETY EQUIPMENT

Workers required to use respiratory protection must read and follow HLA's Respiratory Protection Program (Attachment D).

1. LEVELS OF PPE

1,3,4,5 Level D PPE

Cloth coveralls/field clothes
Inner gloves
Safety glasses
Steel-toed chemical-resistant boots or leather work boots (use of butyl rubber overboots is dependent on site conditions and the likelihood of working in wet areas)

1,3,4,5 Modified Level D PPE

Tyvek or Saranex coveralls
Inner gloves and nitrile outer gloves (Neoprene or PVC when handling corrosives)
Hardhat
Safety glasses (Chemical splash goggles when handling corrosives)
Steel-toed chemical-resistant boots (with butyl rubber overboots if using leather work boots)
Foam earplugs if required

Note: For Modified Level D PPE the protective outer clothing is a Tyvek or Saranex one-piece coverall. Use of an air-purifying respirator with this suit (along with the other PPE listed for Modified Level D PPE) will constitute Level C PPE.

3,4,5 Level C PPE

Tyvek or Saranex coveralls
Inner gloves and nitrile outer gloves
Hardhat
Safety glasses
Steel-toed chemical-resistant boots (with butyl rubber overboots if using leather work boots)
Foam earplugs (when necessary)
Full-face or half-face air-purifying respirator[1] with organic vapor/HEPA/pesticide/acid cartridges (change daily)

2 Level B PPE

If breathing zone concentrations of volatile organic compounds (VOCs) equal or exceed 5 parts per million (ppm) as measured by a PID, Level B PPE will be used. This will consist of a hooded Saranex suit, SCBA, inner and outer gloves, steel-toed chemical-resistant boots, and overboots.

The Respiratory Protection Program presented in Appendix C details respirator selection, training, cleaning, and maintenance.

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[1] The use of a respirator is dependent on organic chemical concentrations in the breathing zone greater than background and less than 5 ppm as determined by PID monitoring (see Section J). Use of a respirator will constitute Level C PPE.

2. **REQUIRED PPE BY TASK**: PPE that should be used for each task is as follows:

Task	Protection Level
1	Level D modified Level D, otherwise leave area
3,4,5	Level B, Level C modified Level D, or Level D (depending on air-monitoring data), otherwise leave area

3. **UNKNOWN SITUATIONS**: For unknown, uncharacterized, and unanticipated situations, field activities must begin in Level B PPE. Downgrade to Level C or D PPE will not be permitted.

L. DECONTAMINATION AND DISPOSAL PROCEDURES

1. **EQUIPMENT DECONTAMINATION**: Rinse or wipe with Liquinox solution rinse or wipe with distilled water.

2. **PERSONNEL DECONTAMINATION**:

Entering the Contamination Reduction and Exclusion Zones

Before entering the Contamination Reduction or Exclusion Zones, all personnel will:

a. Sign entry/exit log,

b. Don coverall for the task assigned,

c. Don boots or shoe covers/overboots, as appropriate, with gloves, and tape the seams, and

d. Don Level B or C respirator and hardhat, and proceed to work area.

Leaving the Exclusion Area

Before leaving the Exclusion Zone, all personnel will:

a. Wash the rubber boots in the first wash tub containing Alcanox cleaner. Brush the boots thoroughly using a stiff brush. Special attention is needed to brush all contaminated material from the boot tread.

b. Rinse the rubber boots in the second tub containing clean water.

c. Final rinse the rubber boots in the third tub containing clean water. Proceed to the CRZ.

d. Unzip the outer coverall, then remove the outer gloves and dispose of them as contaminated trash.

e. With Level B work, the SCBA pack must be removed, leaving the respirator in place. Remove the outer coverall and dispose of it as contaminated trash. Take care to prevent cross-contamination from the contaminated outer side of the garment to the clean inner side.

f. Without removing the respirator, wipe the outer surface with a damp rag. Wipe down safety glasses, hardhat, and any other equipment (e.g., air monitors, cameras) with the damp rag. Dispose of the rag as contaminated trash.

g. Remove the rubber boots and place them on the boot rack.

h. Remove and wash the respirator with disposable respirator wipes.

i. Remove and dispose of inner gloves as contaminated trash.

j. Sign out on exit log.

k. Regardless of the level of protection required, field personnel should thoroughly wash hands and face before taking any breaks and before leaving the site.

All contaminated PPE will be disposed of in covered and lined 55-gallon drums. Once full, the bags will be disposed of with the solid hazardous waste generated onsite. The SHSO will frequently inspect respirators for cleanliness and general condition.

3. INVESTIGATION-DERIVED MATERIAL DISPOSAL

a. Drill cuttings/well water: N/A

b. Decontamination solutions: Drummed onsite

c. PPE: Drummed onsite (if Level B, Level C, or modified Level D are used)

M. DOCUMENTATION

1. **TRAINING AND MEDICAL RECORDS FOR HLA PERSONNEL:** These records are permanently maintained in the HLA Santa Ana, California office. Also, these records will be maintained onsite as necessary.

2. **PROJECT PERSONNEL LIST AND SAFETY PLAN DISTRIBUTION RECORD**

   a. HLA Employees

   All project staff must sign the master copy of this document, indicating they have read and understand it. Copies of this document must be made available for their review and readily available at the job site.

LOG OF HLA PROJECT PERSONNEL

Employee Name/Job Title	Date Distributed	Signature

   b. Contractors and Subcontractors

   Copies of this document will be provided to contractors and subcontractors who may be affected by activities addressed herein. All contractors and subcontractors must comply with this document and applicable OSHA, EPA, and local government rules and regulations signifying that they have read and understand the material present within.

LOG OF CONTRACTOR AND SUBCONTRACTOR PROJECT PERSONNEL

Company Name	Contact Person	Date Distributed

3. **HEALTH AND SAFETY MEETINGS**: All project personnel must receive initial health and safety orientation. Thereafter, a brief tailgate safety meeting is required as deemed necessary by the Site Safety Officer or at least once every 10 working days.

HEALTH AND SAFETY MEETING LOG

Date	Topics	Name of Attendee	Company Name	Employee Initials

4. **VISITORS**: It is HLA's policy that visitors must furnish their own PPE. All visitors are required to sign the Visitor Log and comply with guidelines, rules, and procedures presented herein. If the visitor represents a regulatory agency concerned with site health and safety issues, the Site Safety Officer must immediately notify the DHSO.

VISITOR LOG

Name of Visitor	Company Name	Date of Visit	Signature

N. CONTINGENCY/EMERGENCY INFORMATION

1. REQUIRED EMERGENCY EQUIPMENT LOCATION

Safety shower/eyewash: HLA vehicle and be kept within 10 seconds travel distance of workers
First-aid kit: HLA vehicle and at locations of potential flammable or combustible materials
Fire extinguisher: HLA vehicle
Other: Safety shower/eyewash will comply with ANSI Standard 2358.1

2. EMERGENCY TELEPHONE NUMBERS

Ambulance: Emergency Number 911
Police: Emergency Number 911
Fire department: Emergency Number 911
Hospital: Norwalk Community Hospital (310/863-4763) County USC Burn Unit (213/226-2345)
Emergency air lift: Emergency Number 911
Poison Control Center, local: Emergency Number 911
CHEMTREC: (800) 233-3360
Client contact: Chirstine Bathker Office 818/505-2732 Home N/A

Project Manager: Donald Quigley Office 714/556-7992 Home N/A

Site Supervisor: Gregory Albright Office 714/556-7992 Home 310/434-5224

DHSO: Heriberto Robles Office 714/556-7992 Home 714/551-6107
Pager (714) 733-5341

3. STANDARD PROCEDURES FOR REPORTING EMERGENCIES

When calling for assistance in an emergency situation, the following information should be provided:

1. Name of person calling
2. Telephone numbers of caller's location
3. Name of person(s) exposed or injured
4. Nature of emergency
5. Actions already taken

The recipient of the call should hang up first - not the caller.

4. **EMERGENCY ROUTES**: See Plate 1. Leave entrance on Lakeland Load, turn left on Lakeland Road and left onto Bloomfield Avenue. Proceed south on Bloomfield Avenue approximately two miles to Foster Street. Hospital on the left.

5. **CONTINGENCY PLANS**: All accidents requiring medical attention will be expeditiously routed to appropriate facilities. No onsite personnel will implement Emergency Response Procedures for chemical hazards and/or situation. Contact appropriate agency. Take roll call at front gate in case of emergency. Accidents requiring services of the burn unit will have the injured helicopter evacuated from the site.

O. GLOSSARY

AGST	Above Ground Storage Tank
DHSO	Designated Health and Safety Officer
°F	degrees Fahrenheit
EPA	U.S. Environmental Protection Agency
H_2S	hydrogen sulfide
HEPA	high-efficiency particulate/aerosol
HLA	Harding Lawson Associates
mR/hr	milliroentgen per hour
O_2	oxygen
OSHA	Occupational Safety and Health Administration
PID	photoionization detector
ppb	parts per billion
PPE	personal protective equipment
ppm	parts per million
SCBA	self-contained breathing apparatus
TLV	Threshold Limit Values
VOC	volatile organic compound

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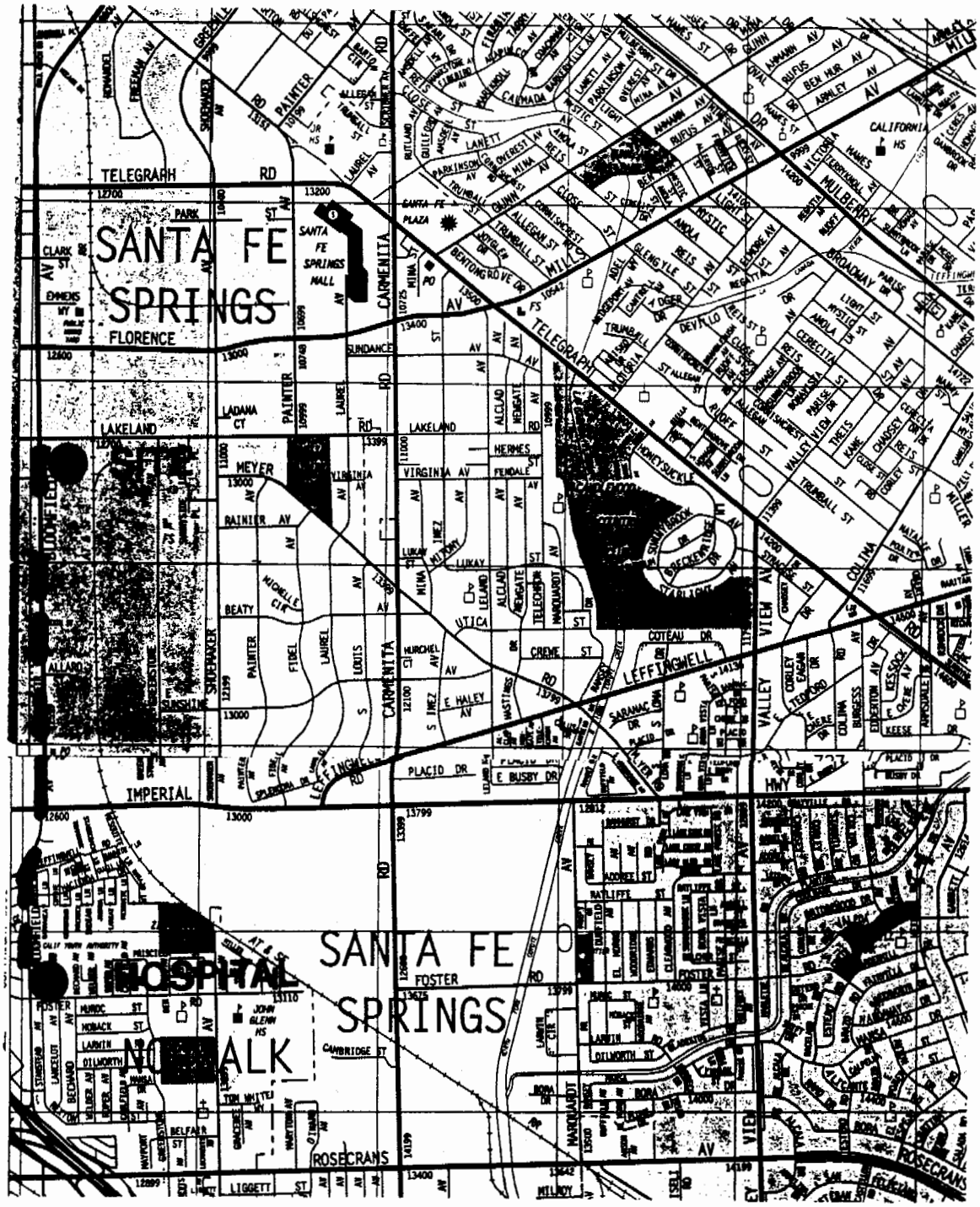

Harding Lawson Associates
Engineering and
Environmental Services

HOSPITAL LOCATION MAP
Walker Property Site
Santa Fe Springs, California

PLATE
1

DRAWN	PROJECT-TASK NUMBER	APPROVED	DATE	REVISED	DATE
LJH	22263-2	GRA	2/93		

ATTACHMENT A

INSPECTION CHECKLIST

HLA HEALTH AND SAFETY

FIELD AUDIT CHECK LIST

Date: _____ HLA Employee in Charge at Site:
Job Name: _____
Job Number: _____ _____
Location: _____

1) Copy of Job Safety Plan or informal H&S plan.

2) Personal protective equipment:

Head	Respirator	Ear	Eye/Face	Foot	Hand
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

3) Safety Equipment:
GFCI Electrical Cords Signs Barrier Tapes
Vest Other

Safety Hazards:
Lifting Housekeeping Equipment Usage
Trenching Other

4) Instruments _____ calibrated Yes ___ No ___ _____

maintenance

5) Proper tools?

6) Hazardous Materials:

7) Site: decon, exclusion zone, water, etc.

8) Tailgate meetings, visitor log, personnel list, subcontractor, drillers

9) Comments, observations:

ATTACHMENT B

EQUIPMENT CALIBRATION AND PREVENTATIVE MAINTENANCE

This section describes Harding Lawson Associates (HLA's) standard operating procedures for use and maintenance of field equipment to be used during field activities. The equipment is described and the calibration, field checking, and operations and maintenance procedures are detailed to the extent necessary to properly maintain each item. Detailed procedures are provided in the site Sampling Plan (SP).

A program has been developed to ensure that equipment is properly maintained. This program has been developed on the following premises:

- Procedures are in accordance with the manufacturers' maintenance and calibration guidelines.
- All equipment calibration, operation and maintenance procedures, and field checking procedures defined herein will be performed by properly trained HLA personnel.
- Only designated personnel may calibrate, operate, and maintain certain instruments (e.g., HNu).
- Records will be maintained to allow tracking of the calibration, operation, and maintenance history of a given instrument or item of equipment.

PHOTOIONIZATION DETECTOR (PID) OR FLAME IONIZATION DETECTOR (FID)

The PID or FID will be used to measure the concentration of trace gases present in ambient air. Procedures specified by the manufacturer in the owner's/operator's manual for calibration, operation, and maintenance will be followed.

Calibration will be performed daily before initiating field activities. The meter's battery will also be checked daily at the end of each day's field activities and will be recharged overnight, if necessary. Calibration is begun by attaching the instrument to a pressurized container of calibration gas or a Tedlar bag filled with appropriate calibration gas by means of a narrow, flexible hose and turning on the gas. If the meter reading does not approximately match that of the gas rating, the instrument must be adjusted until the reading is almost identical to the rating.

PERSONAL MONITORING PUMPS (SKC MODEL 224-43 OR EQUIVALENT)

All pumps will be fully charged before calibration and use. Calibration will be performed before and after each sampling event by using a soap bubble burette and measuring the time required for a bubble to pass between two scale markings. A representative sampling assembly (e.g., charcoal adsorption tube, filter cassette) will be placed in line during calibration. Maintenance will be performed according to the manufacturer's recommendations.

EXPLOSIMETER (GASTECH, MODEL 1314, OR EQUIVALENT)

An explosimeter will be used to measure concentrations of flammable vapors and gases in air. Calibration, operation, and maintenance procedures specified by the manufacturer in the owner's/operator's manual will be followed. This instrument will be calibrated daily before start-up of field activities. To begin calibration, the instrument is adjusted to zero, and the flow meter is connected to the calibration gas canister and the instrument. A low-volume flow is started from the gas canister, and the highest reading on the instrument meter is compared to that of the gas rating. If the match is incorrect, the instrument will be adjusted and checked again.

ATTACHMENT C

HEALTH AND SAFETY PROGRAM

SAFETY TRAINING REQUIREMENTS

To ensure understanding of and adequate protection against potential hazards associated with this project, all site personnel will have participated in a safety training class that meets California Occupational Safety and Health Administration (OSHA) standards (8 California Code of Regulations [CCR] 5192, Paragraph [e]). Site personnel include drillers, helpers, field engineers, geologists, technicians, and onsite supervisors. Harding Lawson Associates (HLA)/Harding Construction Services (HCS) is not responsible for training subcontractor employees, but these individuals will be required to meet OSHA standards. Site visitors must be accompanied by a person who has completed safety training, but visitors will not be permitted inside the Exclusion Zone unless they have completed an OSHA-approved safety course.

At a minimum, safety training classes for site personnel will include the following topics:

- General overview of toxicology and hazard evaluation
- Overview of toxic properties of the hazardous materials possibly present at the site
- Overview of health and advisory limits and occupational standards
- Discussion/demonstration of environmental monitoring equipment to be employed
- Discussion/demonstration/practical session with the personal protective equipment (PPE) to be used
- Discussion of site entry and site control practices and requirements
- Discussion of decontamination procedures to be employed
- Discussion of contingency planning and emergency response
- Discussion of field activities to be conducted and potential hazards relative to each
- Practical session with safety, PPE, and decontamination procedures

Training requirements for all personnel will be a 40-hour safety course and a minimum of three days of on-the-job training under the direct supervision of a trained and experienced supervisor. All managerial personnel will be required to attend an additional eight-hour specialized training course specifically for management of hazardous waste operations. Attendance at the 40-hour safety course can be waived only if the individual has documented experience in hazardous waste site work equivalent to the 40-hour safety course. All personnel will be required to attend an eight-hour annual refresher course. Records and certifications will be maintained for all personnel attending the classes.

MEDICAL MONITORING

All HLA/HCS field employees will receive a yearly comprehensive medical evaluation to qualify for hazardous waste site assignments. These employees also receive exit medical examinations at the termination of their employment with HLA/HCS. Medical records of HLA/HCS employees are kept on file at the physician's office. Clearance letters from the physician are kept at HLA/HCS's Santa Ana, California, office. HLA/HCS is not responsible for subcontractor medical monitoring; however, subcontractors are expected to monitor their employees according to OSHA standards.

Medical monitoring will include a medical and work history for each employee. A determination of the fitness of the employee to wear required PPE for site work will be made. The examining physician will be given a copy of 29 CFR 1910.120, the employee's duty description, anticipated exposure levels, PPE to be used, and any applicable information from previous medical examinations.

A copy of the examining physician's written opinion of the employee's fitness for hazardous duty will be given to the employee.

SAFETY PLAN IMPLEMENTATION AND MODIFICATION

Before any activities begin on or around the site, a meeting will be held with all site personnel to discuss safety procedures and to familiarize personnel with the potential hazards of the site. Any changes in the site safety plan will be discussed with the Santa Ana DHSO before being applied at the site. All site personnel will be informed both orally and by written memorandum of any and all changes.

The Site Safety Officer (SSO) will conduct inspections of the site on a frequent and regular basis. If any operation, practice, or equipment does not pass inspection, the SSO will notify the DHSO and will have the authority to cease operations and/or remove faulty equipment. Unacceptable practices and/or faulty equipment will be remedied immediately, and the site safety plan will be modified to correct any deficiencies in the effectiveness of the plan.

STANDARD OPERATING PROCEDURES

The following Standard Operating Procedures (SOPs) have been developed to minimize hazards to site personnel. The SSO has authority on all day-to-day health and safety issues.

- Eating, smoking and/or chewing tobacco, or chewing gum in the Exclusion Zone and Contamination Reduction Zone is prohibited. These activities are also prohibited in the Support Zone until the hands and face have been washed upon return from the Exclusion Zone.

- The number of personnel in the Exclusion Zone will be limited to the minimum necessary to complete the required work action. No visitors without adequate safety training will be permitted inside the Exclusion Zone.

- All field personnel will be located upwind of any field activity.

- The Exclusion Zone will be clearly marked with flagging or traffic cones that enclose a circle with a radius of 30 feet. Entrance to this area will occur only while in proper PPE and with a "buddy." The "buddy system" will also be in effect at any work zone where respirators are being worn.

- While in the Exclusion Zone, all personnel will avoid contact with objects or soil unless the contact is necessary to the field operation.

- Eyewash units and emergency showers will be located as near the source of hazard as physically possible.

- Smoking and other means of ignition (e.g., sparking equipment) will be prohibited in the work area and whenever flammable liquids are present.

- If ambient air concentrations in the breathing zone rise above background, the site will be evacuated until concentrations have dropped to background again or until provisions for the appropriate respiratory protection are made as indicated below.

- Respiratory protection will be determined as follows:

    - Above zero (background) to 5 parts per million (ppm) - respirators with combination cartridges will be worn.

- 5 ppm to 500 ppm - self-contained breathing apparatuses (SCBAs) or a cascade system of supplied air will be utilized.
- 500 ppm or above - a fully encapsulating suit must be worn.
- Particulate in the breathing zone - respirators with combination cartridges will be worn.

SITE CONTROL

As discussed in the SOPs, no person without adequate safety training will be permitted to enter the Exclusion Zone. The Exclusion Zone will be clearly marked with flagging or traffic cones. Anyone entering this area will be required to don the appropriate PPE. Before exiting the site, personnel will remove and/or decontaminate PPE at the decontamination pad. A temporary zero-discharge decontamination pad will be constructed for steam cleaning downhole equipment, field vehicles, and the drill rig. Any discharge collected in the decontamination pad will be pumped into barrels for onsite storage. Barrels for disposal of used PPE, wash tubs, brushes, and any other equipment necessary for decontamination will also be available.

AIR MONITORING

An OVA flame ionization detector (FID) photoionization detector (PID) will be used to monitor ambient air for breathing zone contaminants. If ambient air concentrations in the breathing zone rise above zero or background, PPE will be upgraded and respirators will be donned, as indicated under SOPs. If the ambient air concentrations continue to rise and meet or exceed 5 ppm, all field activities will cease and all personnel will exit the site through the CRZ. Re-entrance to the site will not be permitted until ambient air concentrations have dropped to less than 5 ppm or, if ambient air concentrations do not drop, until provisions for upgrading PPE to Level B have been made. Level B PPE is acceptable up to 500 ppm. If ambient air concentrations exceed 500 ppm, Level A PPE must be employed.

Personal air monitoring will be conducted on the basis of site activities, work tasks, and the likelihood of exposure. It will also be conducted if particulate resulting from field activities are noted in the breathing zone for more than 10 consecutive minutes during the working day. The person most likely to have the greatest exposure will wear the personal air-monitoring device. The SSO will make the determination.

CALIBRATION AND MAINTENANCE OF MONITORING EQUIPMENT

Calibration of the PID will be performed daily before initiation of field activities. The rechargeable battery will also be checked at the end of the day and will be recharged overnight if the charge is low.

This equipment will be calibrated and maintained by the SSO in accordance with maintenance and calibration procedures specified in the manufacturer's/owner's/operator's manual.

RESPIRATORY PROTECTION

The cartridges to be used during this project will be Scott 642-OV-H or equivalent. These cartridges are approved against atmospheres containing:

- Pesticides
- Mists of paints, lacquers, and enamels
- Organic vapors (not exceeding 1000 ppm by volume)
- Dusts, fumes, and mists having a time-weighted average less than 0.05 milligrams per cubic meter
- Asbestos-containing dusts and mists

- Radionuclides and radon daughters attached to dusts, fumes, and mists or any combination of the above

Cartridge respirators will be worn at any time ambient air concentrations rise above background up to but not including 5 ppm or when dust is present in the breathing zone. If ambient air concentrations equal or exceed 5 ppm, personnel will exit the site until provisions to upgrade PPE have been made. Re-entrance to the site when ambient air concentrations are 5 ppm or above will be permitted only in Level B PPE (SCBA or cascade system). Level B PPE will continue until ambient air concentrations are below 5 ppm. If ambient air concentrations continue to rise and meet or exceed 500 ppm, Level A PPE (fully encapsulating suit) must be utilized to continue field activities.

Details of the Respiratory Protection Program are presented in Appendix D.

EMERGENCY RESPONSE

All field personnel working on this project will be given a copy of the site safety plan. This plan will be discussed in a safety meeting before commencement of field activities. Actions to be taken in an emergency situation will also be discussed in this meeting.

In the unlikely event that an emergency situation occurs, all field activities at that site will cease. The emergency situation will be signaled by a blast from a carbon dioxide (CO_2) propelled air horn. The following signals will be used onsite:

- One long blast indicates ambient air concentrations are unsafe for the PPE being used. Personnel will (1) exit the site through the Contamination Reduction Zone (CRZ) and upgrade PPE or (2) wait for ambient air concentrations to drop to a safe level for the PPE being worn.

- One short blast indicates a minor emergency such as cuts, abrasions, etc., which can be dealt with using proper decontamination and first aid. Affected personnel will exit through the CRZ.

- One long blast and one short blast indicates a field person is down or seriously injured and will need the assistance of emergency medical personnel. Exit from the site will be through the CRZ.

- Two long blasts indicate a major emergency (such as drilling into a drum that catches fire) in which exit from the site will be to the nearest clean area upwind. All personnel will be accounted for. A temporary CRZ will be set up at the point of exit for personnel to decontaminate to minimize the possible spread of contamination into clean areas.

The following hand/body emergency communication signals should be used when other forms of communication are difficult or impossible:

Signal	Meaning
Hand clutching throat	Out of air/can't breathe
Hands on top of head	Need assistance
Thumbs up	OK/I'm all right/I understand
Grip partner's wrist or both hands around partner's waist	Leave area immediately

If the emergency occurs in the Exclusion Zone, all field personnel will quickly move to the CRZ for a complete decontamination before exiting to the Support Zone. In life-threatening emergencies, decontamination may not be appropriate. Emergency situations occurring outside of the Exclusion Zone in Level D PPE will not require decontamination at the CRZ before administering first aid.

Minor emergencies will be handled within the Support Zone utilizing the onsite first-aid kit. A portable emergency eyewash and a decontamination shower will also be available in the field vehicle and the support office. At least one onsite HLA/HCS person will be trained in first aid and cardiopulmonary resuscitation (CPR). The appropriate emergency response personnel (ambulance, fire department, etc.) will be contacted for all major emergencies.

Routes to the nearest hospital are provided in the main text of this document. A written report of all emergencies will be submitted to HLA/HCS's Santa Ana, California, office. Copies of this report will also be sent to the appropriate agencies.

ATTACHMENT D

RESPIRATORY PROTECTION PROGRAM

RESPIRATOR ADMINISTRATION

The Respiratory Protection Program Coordinator for this project is Harding Lawson Associates (HLA's) Santa Ana Health and Safety Officer (DHSO) (currently Mr. Heriberto Robles). Responsibilities of the Respiratory Protection Program Coordinator include selection and purchase of respirators, organization of training, and administration of the program to include use, maintenance, storage, and sanitary care.

The project manager and supervisors will oversee the specific program activities and tasks. The project manager and supervisors will also be responsible for issuing respirators and enforcing their use.

RESPIRATOR SELECTION

Respirators will be selected by the DHSO in cooperation with the project manager and supervisors. Only respirators and cartridges approved by the National Institute for Occupational Safety and Health will be selected for use based on the nature of the hazard and its concentration.

Typical jobs and types of respirators used at HLA/HCS are as follows:

Job	Type of Respirator
Soil sampling in potentially pesticide-contaminated areas	Scott Model #65, full-face, 642-OA-H cartridge
Monitoring-well installation and sampling in potentially solvent-contaminated areas	Scott Model #65, full-face, 642-OA cartridge

Respirators will be purchased from an authorized manufacturer's representative. Employees will be informed of the brand name and model of respirator indicated on the employee's fit test record.

RESPIRATOR ASSIGNMENT

Respirators will be individually assigned and marked with a unique identification number. If not assigned, the office safety and supply coordinator is responsible for sanitation and re-issue of the respirator.

RESPIRATOR TRAINING

Training will be conducted during the employee's annual Hazardous Materials Health and Safety Training or at the time of issue. Training will include respiratory hazards; alternate engineering/administrative controls; respirator types based on hazard; functions, capabilities, and limitations of respirators; donning and fit testing; proper wearing; and maintenance. Training will be conducted by the DHSO using the following training aids and materials:

- Manufacturer's instructions
- HLA's Health and Safety Training Manual
- Hands-on training and formal presentations during safety training
- American National Standards Institute's Practices for Respirator Protection - Z88.2, 1980
- Occupational Safety and Health Administration Standards

RESPIRATOR CLEANING/SANITIZATION

Each employee will be responsible for cleaning his or her respirator. A sink, detergent, and sanitizer for respirator cleaning and sanitizing will be available.

RESPIRATOR INSPECTION AND MAINTENANCE

Emergency respirators will be inspected monthly by the DHSO, and the date and inspector's initials will be noted on the respirator tag. A log of these inspections will be maintained in the respirator record files.

Respirator repairs and maintenance will be performed by the DHSO and/or approved alternate or a factory-authorized representative. There will be no replacement of parts or repairs beyond the manufacturer's recommendations.

RESPIRATOR STORAGE

When not being worn, respirators will be stored in a manner that protects them from dust, chemicals, sunlight, and extreme heat, cold, or moisture.

Respiratory Protection Program effectiveness will be evaluated through regular inspections of each area where respirators are used or stored. The DHSO or Site Safety Officer (SSO) will be responsible for program evaluation at remote project locations.

RESPIRATOR RECORDS

Records for the Respiratory Protection Program will be maintained in the HLA/HCS-Santa Ana office health and safety files. The records will include at a minimum the following:

1. Approximate numbers and types of respirators in use
2. HLA/HCS respirator user approval forms
3. Medical evaluation sheets
4. Program surveillance and maintenance reports
5. Respirator inspections logs

APPENDIX B

APPENDIX B

HAZCAT® PROCEDURES

The HazCat ® Chemical Identification System is a unique time saving tool designed especially for on-site use by emergency response personnel, environmental health specialists, hazardous materials specialists, and anyone associated with the use, storage, or transportation of hazardous materials. The HazCat System requires training, but no previous chemical experience.

The user of the HazCat System can identify and/or categorize virtually any unknown liquid or solid in minutes, which will allow the user to provide the vital information necessary to make crucial decisions on the selection of proper protective clothing, containment activities, and decontamination procedures. The user will also identify commonly spilled non-hazardous materials, thus saving time and unnecessary clean-up costs.

The HazCat System uses three preliminary screening tests in a decision tree format to quickly separate an unknown into one or more distinct categories. Generally, the unknown can then be identified with no more than 4 to 5 additional tests.

If the HazCat System is unable to identify the specific material, the HazCat user will have seen the most important physical and chemical aspects of the unknown during the identification process. These aspects include: identifying the unknown as an organic or inorganic substance, identifying the unknown's oxidizing potential, relative density, relative flammability, water reactivity, and volatility. The user of the HazCat System will be able to classify the unknown into a Department of Transportation (DOT) and/or Environmental Protection Agency (EPA) hazard classification (except radioactive). The system will identify multiple characteristics of the unknown.

The HazCat System is a multi-leveled system that with a minimal amount of training, a person should be able to identify the 200 or so most likely spilled materials using the solids and liquids decision tree process. With progressive levels of training the full potential of this lab-in-a-box can be reached.

HAZ-CAT TEST PROCEDURE DESCRIPTIONS

1. Observation of Sample

Color, viscosity, turbidity and other characteristics of the sample should be noted. Multiple layered samples require testing of each layer unless the layers mix well and remain so during testing.

2. Flammability

Flammability is tested with a GX-3 or MSA360 flammable vapor tester. The tester is first zeroed per the instruments instructions. The end of the "sniffer" tube is then placed near the surface of the sample with the instrument on. If the meter deflects more than 1% LEL, the sample is deemed flammable. The reading should be noted on the worksheet. If possible, a known flammable liquid should be checked to assure instrument functionality.

3. Combustibility - (If negative for flammability)

Wrap a strip of tin foil around the metal scoopula. If a liquid is to be tested, form a well to hold the liquid in the foil. Place 2-3 ml in the scoopula (foil) and attempt to ignite the sample in the burner flame for 1-2 seconds. Remove the scoopula from the flame. If the material continues to burn (sustain combustion) then the material is considered combustible. Note any changes in the sample - e.g. melting, thickening, odor change, etc.

4. Specific Gravity/Solubility

For liquids, fill a test tube approximately one-quarter full with water. Add an equal volume of sample to the water. For solids, add 1 part sample to 4 parts water. Agitate with the sample dropper to mix. Note whether sample sinks, floats, or dissolves. If the sample dissolves, note whether the mixture is clear or turbid. If the sample sinks, it is denser than water and probably contains more than 50% chlorinated hydrocarbons or PCB's. If the sample floats, it is less dense than water and probably contains more than 50% hydrocarbons. Liquid samples that dissolve are water solutions or may contain alcohols or certain ketones.

5. Water Reactivity/Solubility

This test can be done in conjunction with the specific gravity test. Add sample to water as in the specific gravity test and note any reaction. Watch for bubbles, foaming, temperature changes or vapor evolution.

6. Solution pH

Solution pH indicates the acidity or alkalinity of the sample; pH is always measured in water. If the sample sinks or floats, take a drop of water layer and place on a pH test strip. Match the test strip color with the chart on the test paper container to determine pH. Record the result. If the pH is greater than 9, the sample should be tested for cyanide, sulfide, and oxidantin that order. If the pH is less than 9, the sample should be tested for oxidant only.

7. Cyanide Test

If the sample pH is less than 11, it must be adjusted with sodium hydroxide solution. To a half filled test tube of sample, add one drop at a time of 6N sodium hydroxide solution until pH is 11 or greater using pH test paper to check. Then add 3-4 drops of p-dimethylaminobenzal rhodanine solution and mix. Finally, add 1 drop of 0.02 N silver nitrate and mix. The formation of a reddish-brown precipitate indicates no cyanide (less than 0.1%) is present. If no precipitate is formed or it redissolves, cyanide is present. Note results on summary sheet. If cyanide is present, care must be taken when proceeding to the sulfide and oxidant tests. These tests require addition of acid which would liberate toxic hydrogen cyanide gas. Therefore, tests should be done out-of-doors or in a fume hood and breathing of vapors avoided!

8. Sulfide Test

Adjust pH of sample to less than 4 by adding concentrated hydrochloric acid dropwise to sample in a test tube. Use pH test paper to check. Wet a strip of lead acetate test paper with water and hold the paper over the mouth of the test tube. If the paper turns brownish-black, sulfide is present (100 ppm) in the sample. Record results.

9. Oxidizer Tests

Wet a strip of potassium iodide test paper with a drop of concentrated hydrochloric acid. Then touch wetted paper with a drop of sample. If the paper turns to a dark purple or black, an oxidant is present (100 ppm). A light purple does not indicate a positive test. If the test is negative, add a drop of sample to a spot test plate. Then add a drop of diphenylamine indicator solution to the drop of sample. A dark blue color indicates a nitrate oxidizer which is not detectable with potasssium iodide paper. Neither test detects perchlorates or persulfates.

10. Chlorinated Hydrocarbons/PCB's - (Liquids only)

Heat copper wire in a propane torch flame until glowing. Dip hot wire into distilled water to cool. Dip wire into a portion of sample and place in flame. A green color flame near the end of the burning cycle indicates the presence of chlorinated hydrocarbons or PCB's (1-2% depending on type). However, if the sample is water soluble, the presence of salts and acids may give a false positive test.

HAZ CAT KIT INVENTORY LIST

Kit # _____

Date _____

Foreman/Leadperson _____

Check
IN /OUT

A. REAGENTS

1. ___/___ Hydrochloric Acid, concentrated - 60 ml squeeze bottle
2. ___/___ Sodium Hydroxide, 1 Normal - 60 ml Squeeze bottle
3. ___/___ Water - Wash bottle
4. ___/___ Rhodanine solution - 30 ml squeeze bottle
5. ___/___ Silver Nitrate, 0.02 Normal - 30 ml dark squeeze bottle
6. ___/___ Diphenyamine solution - 30 ml squeeze bottle

B. TEST PAPERS

1. ___/___ Colorphast pH strips, one box
2. ___/___ Lead acetate, one vial
3. ___/___ Potassium Iodide - Starch, one vial
   ___/___

C. SUPPLIES

1. ___/___ Test Tube rack
2. ___/___ Test Tubes, 30
3. ___/___ Disposable eyedroppers
4. ___/___ Spot test plate
5. ___/___ Stainless steel scoopula
6. ___/___ Spark lighter
7. ___/___ Propane torch
8. ___/___ Copper wire
9. ___/___ Tongue depressors
10. ___/___ Plastic Scoops, 4
11. ___/___ Chem Wipes, 1 box
12. ___/___ Plastic sample cups, 1 dozen
13. ___/___ Copper wire for Beilstein test
14. ___/___ Ziplock Baggies
15. ___/___ Thermometer
16. ___/___ Disposable Glass pipettes, 10
17. ___/___ Squeeze bulb
18. ___/___ PVC Drum liners, 2
19. ___/___ Tin Foil stips, 2 dozen
20. ___/___ Forms

D. PROTECTIVE CLOTHING

23. ___/___ Yellow Coated Tyvek
24. ___/___ Polyethyene disposal gloves, (1 handful)
25. ___/___ Green Nitrile disposable gloves (Solvex), 3 pr.
26. ___/___ Chemical goggles, 1 pr.

HAZ CAT KIT INVENTORY LIST

Kit # _____

Date _____

Foreman/Leadperson _____

Check
IN /OUT

A. REAGENTS

1. ___/___ Hydrochloric Acid, concentrated - 60 ml squeeze bottle
2. ___/___ Sodium Hydroxide, 1 Normal - 60 ml Squeeze bottle
3. ___/___ Water - Wash bottle
4. ___/___ Rhodanine solution - 30 ml squeeze bottle
5. ___/___ Silver Nitrate, 0.02 Normal - 30 ml dark squeeze bottle
6. ___/___ Diphenyamine solution - 30 ml squeeze bottle

B. TEST PAPERS

1. ___/___ Colorphast pH strips, one box
2. ___/___ Lead acetate,.one vial
3. ___/___ Potassium Iodide - Starch, one vial
___/___

C. SUPPLIES

1. ___/___ Test Tube rack
2. ___/___ Test Tubes, 30
3. ___/___ Disposable eyedroppers
4. ___/___ Spot test plate
5. ___/___ Stainless steel scoopula
6. ___/___ Spark lighter
7. ___/___ Propane torch
8. ___/___ Copper wire
9. ___/___ Tongue depressors
10. ___/___ Plastic Scoops, 4
11. ___/___ Chem Wipes, 1 box
12. ___/___ Plastic sample cups, 1 dozen
13. ___/___ Copper wire for Beilstein test
14. ___/___ Ziplock Baggies
15. ___/___ Thermometer
16. ___/___ Disposable Glass pipettes, 10
17. ___/___ Squeeze bulb
18. ___/___ PVC Drum liners, 2
19. ___/___ Tin Foil stips, 2 dozen
20. ___/___ Forms

D. PROTECTIVE CLOTHING

23. ___/___ Yellow Coated Tyvek
24. ___/___ Polyethyene disposal gloves, (1 handful)
25. ___/___ Green Nitrile disposable gloves (Solvex), 3 pr.
26. ___/___ Chemical goggles, 1 pr.

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